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THE SEA AND ITS STORY



EDITED BY
CAPT. FRANK H. SHAW
AND ERNEST H. ROBINSON

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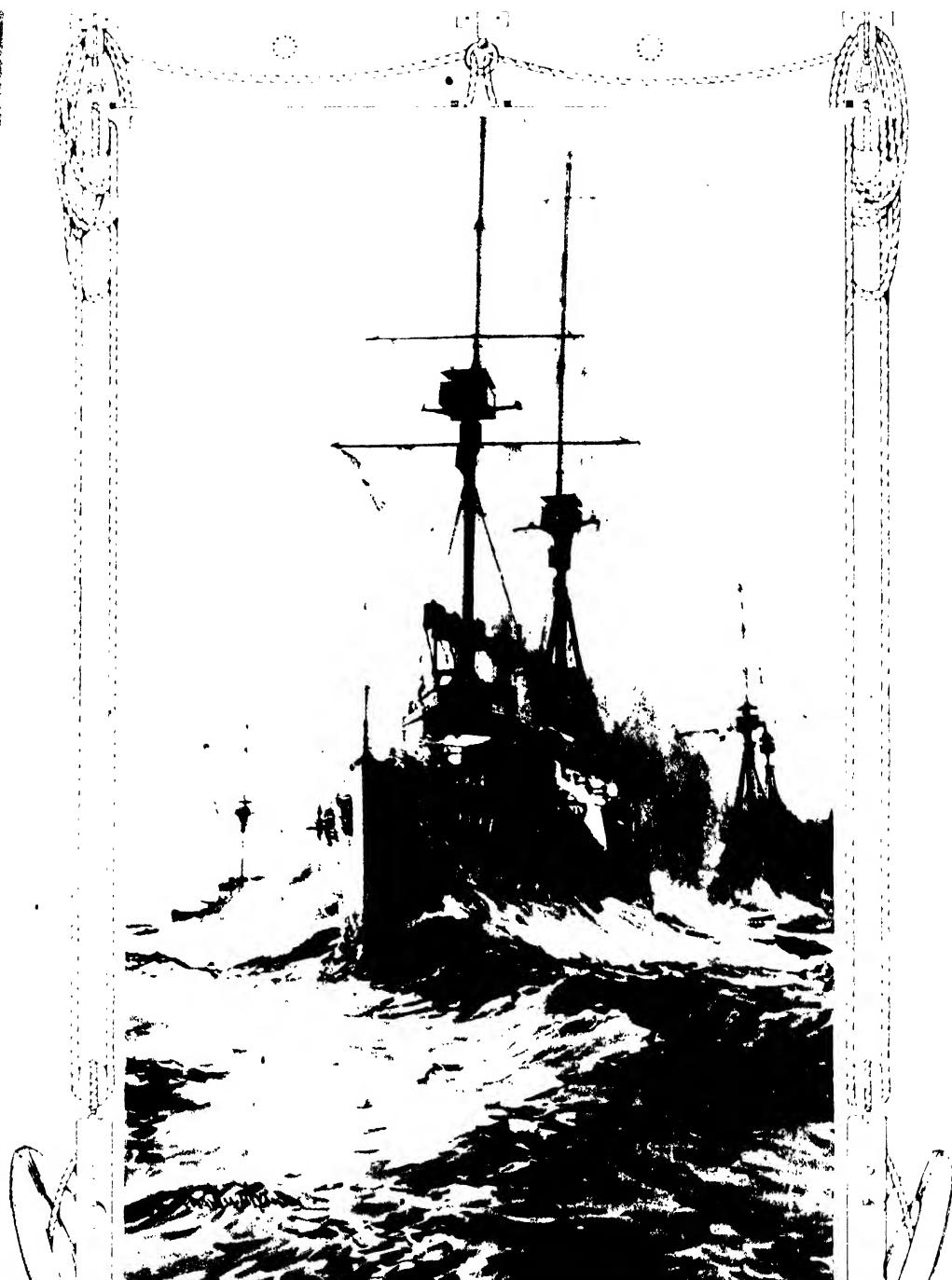
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MAJESTY AND SPEED.

H.M.S. *Lord Nelson*, a First-class Battleship,
leading the line on manoeuvres.
From a photograph, Charlie Devonport.

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From Viking Ship
to Submarine

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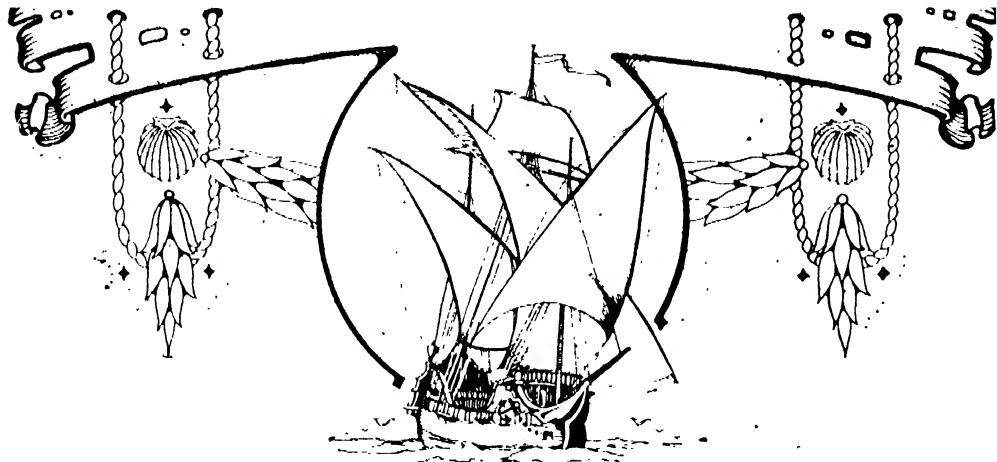


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1910



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The SEA AND ITS STORY



The Magic of the Sea

THE "off-shore wind," the wind that carries our sturdy white-sailed sailing ships on their thousand league voyages to all the corners of the five oceans, the wind that helps our fat-sided merchant steamers on their adventurous journeys and sends the good salt spray flying in pearly clouds along the grim grey sides of our ships of war, calls to Britons with no uncertain voice; and it is because Britons willingly answer that call that our Empire stands to-day the Queen of the Oceans.

Proud we are, and justly proud, of the sea power that secures us peace and assures us of food, but there are no illusions in our pride. We know that others have heard the call of the wind that moves across the deep waters, and that

others have named themselves Sea Kings and have held that title by right. We have only come to our premier position by dint of strenuous fighting against both the ever-angry waters and our fellow-men; but, having fought them and beaten them, we hold out the hands of fellowship across departed years to those sea-using men of other nations who, like ourselves, felt stirring in their inmost hearts the Heaven-sent knowledge of the magic of the sea.

To those who understand, the sea is the most wonderful thing in all our wonderful world. Not because of its immensity or its depth or the ordered regularity of its tidal movements, but just because it is—the Sea. That, after all, is the only answer that can be given when one asks why men, whose natural home is on the land, should leave its solid safety to

The Sea and its Story

toss for months on the unstable waves, trusting their lives to a few inches of wood or a shell of steel almost paper-thin.

The magic of the sea is an incommunicable secret. Not only does she drag the land dweller from the sheltered safety of his firm-founded home, but after she has ill-used him for a lifetime, tossing him in

The Call to Adventure and Mystery

her savage arms and terrifying his soul at every turn with the grinning image of

death, her spell is not lifted. "Gentlemen," says Sindbad the Sailor, as he begins to tell of one of his voyages, "you long, without doubt, to know how, after having been shipwrecked five times and escaping so many dangers, I could resolve again to tempt fortune and expose myself again to new hardships. I am myself astonished at my conduct when I reflect upon it." He had no answer for his landsmen hearers, but we in whose veins there runs the blood of the Norsemen, and whose heritage is born of ten troubled centuries of sea roving and sea fighting, know that the magic of the sea called our old friend Sindbad, and that he answered in the only way he could.

Readers of Longfellow will remember his picture of the old buccaneer who had in his day "singed the beard of the King of Spain and carried away the Dean of Jaen and sold him in Algiers." The old sea captain, hale and brown, in his Moorish cap and dressing gown, cannot be satisfied in his house by the Maeve, with its roof of tiles and weather-cocks flying aloft in the air. In the winter he sits and smokes by the blazing fire, and old seafaring men come in, gnarled, weather-beaten, grey, goat-bearded old fellows, with eyes all wrinkled with much peering through sea fogs and sun glare, with rings in their ears and rings upon their hands. They talk and talk of ventures lost and won long ago, and their talk is ever and ever the same as they drink the red wine of Tarragon out of curiously wrought glasses. But this talk makes the old man even more discontented

with his life of ease. "Restless at times, with heavy strides he paces his parlour to and fro; he is like a ship that at anchor rides and swings with the rising and falling tides, and tugs at her anchor tow.

"Voices mysterious far and near,

Sound of the wind and sound of the sea,
Are calling and whispering in his ear,
'Simon Danz! why stayest thou here?
Come forth and follow me.'

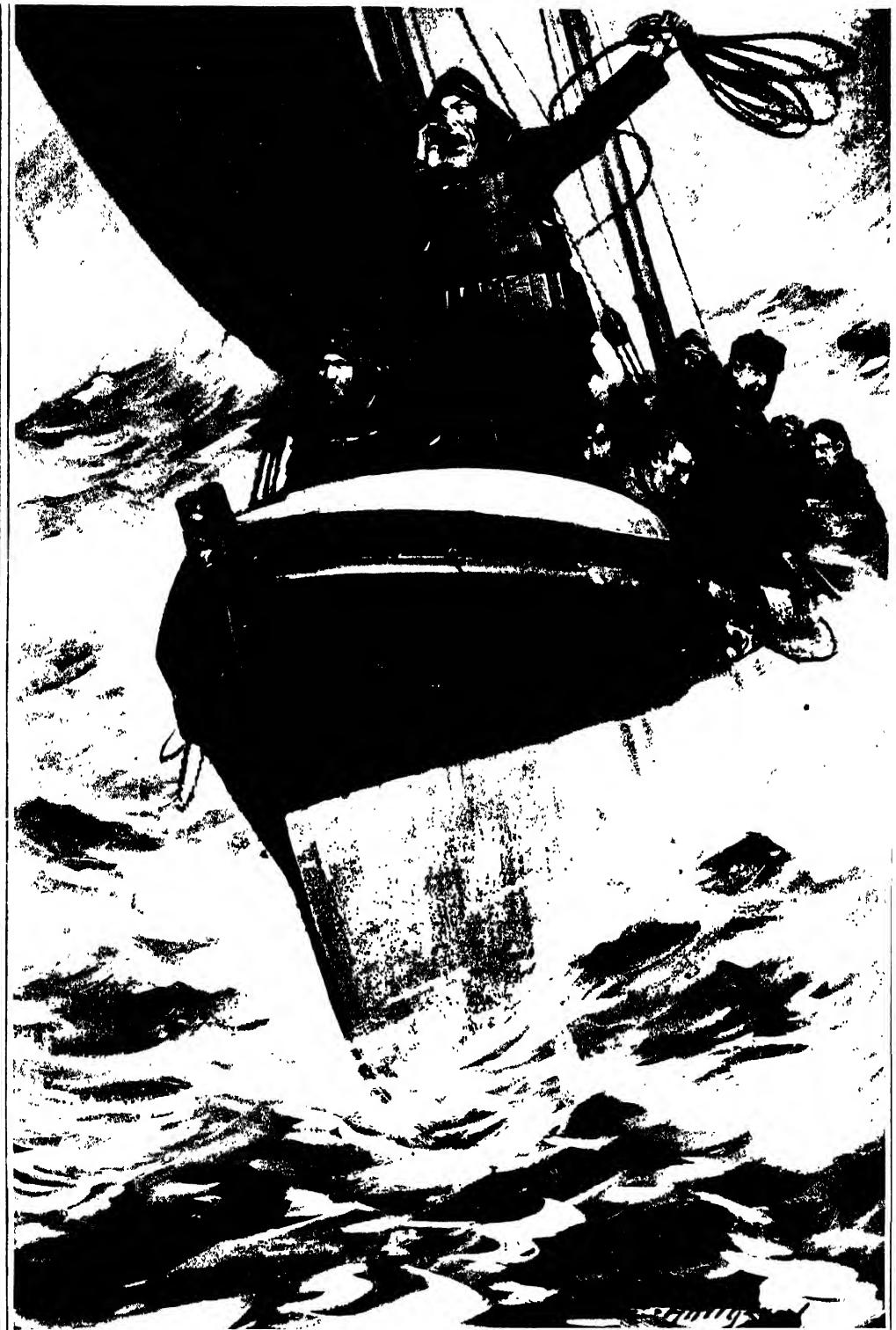
"So he thinks he shall take to the sea again,
For one more cruise with his buccaneers
To singe the beard of the King of Spain
And capture another Dean of Jaen
And sell him in Algiers."

Yes, the magic of the sea, "the call of the off-shore wind and the thresh of the deep-sea rain," is a very potent force, and it is the purpose of this work to present a series of pictures of sea life imbued with that magic, vital with the might and majesty of the ocean itself, telling of its nature and mysteries and of man's high performances upon it. Whether you know the sea because you have used it, or love it because you are a Briton, your heart shall quicken to the crashing roar of the wind hounded combers driving upon far-off strands; you shall snatch the treasure from the holds of sunken galleons, and read the riddles that lie embedded in the ooze and tangle of Davy Jones's locker; you shall adventure fearfully across unknown seas with the first navigators, fight under the flag of Drake, attack the icy Arctic and Antarctic fastnesses with those bold spirits whose only joy is to follow the pointing compass north and south; and you shall hold your breath in joyous amazement as you stand on the bridge of a modern destroyer

The Riddles of Davy Jones's Locker

doing "thirty-six knots" on speed trials.

The whole story of the sea is here, not in its minute details, but in bold, free sketches that take in every salient feature of the noblest life on earth. Yet detail is not missing when it can help those who would experience more intimately the magic of the sea, or where



"ALL SAVED!" The return of a lifeboat with a load of rescued is one more triumph for humanity, one more victory of Man over the Sea.

The Sea and its Story

it helps to show more fully the actual conditions of the sailor's life now or in olden days. Here you have in romantic form the bravery of the greatest sea heroes that have ever lived, the knowledge of the wisest navigators, the dash and daring of smuggler and pirate, and the salt humour of the sailor at his best.

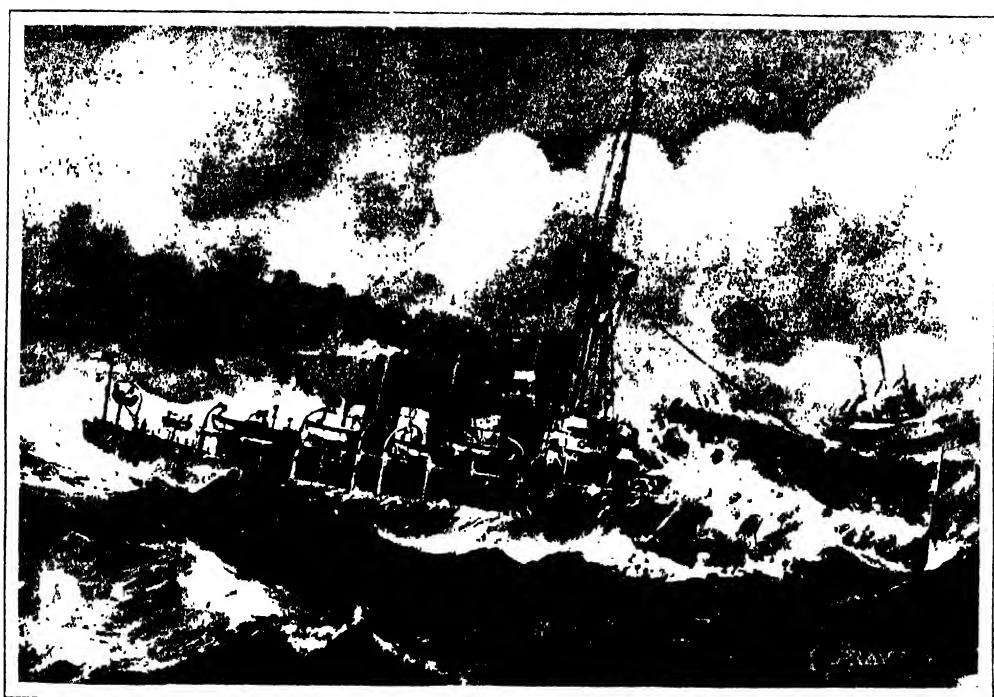
Since time began man has struggled to bend the unwilling sea to his service, and in his struggle he has harnessed the wind and even the waters themselves. No small part of the sea's magic lies in the awful uncertainty as to who will win the next throw in the great, grim game that man plays against the sea.

Fighting the Waves That man is winning, and must win in the end by the aid of devoted bravery and ever-growing knowledge, is certain. Every time a lifeboat threshes, in a swelter of spray, into

harbour, bearing her load of rescued, the bow-man bawling a full-throated "All saved!" to the anxious watchers on the jetty head, the sea has lost one more battle, and one more victory has been scored by man.

Battle, work unceasing, hunger, cold, and weariness of the flesh—all these are the portion of those who "have their business upon the deep waters"; but oh, the glory of the strong, free winds, the kiss of the spray on the cheek and lips, the undescribable wonder of "the blazing tropic night" and long, lazy days under the sun, the spaciousness and freedom of the open sea! All these and more, more than tongue or pen can portray, go to the making of the enticing, persuading, alluring Magic of the Sea.

THE EDITORS.



FOUL WEATHER!

The new "Scout" H.M.S. *Forward* running her trials in a gale. The scout class comes between the destroyers and the third-class cruisers.

Man's Splendid Triumph

The Rise of Britain's Navy

IN telling the romantic story of the sea, many of the most glorious episodes in the history of our country will be dealt with in detail; but that need not deter us, at the outset of that story, from taking a swift review of these and other incidents which were as bricks in the strong tower of our ocean supremacy.

Philosophers have discoursed learnedly of the effect of environment on men and nations, proving beyond doubt or cavil that our surroundings have a far-reaching effect on our natures. Certain it is that the effect of the seas that wash our shores on every side has been to turn us into a sea-loving and sea-dominating people to our great national advantage.

Those tribes of the half-savage races we know as Early Britons, who had their habitations on or near the seashore, were, when the far-roving men of Phoenicia first discovered them, by no means unskilled in the use of small boats, and some of the Romans who later conquered the island spoke highly of the Briton's skill in sea-fishing and the management of boats. They were not a seafaring people, however, and merely used the coastwise waters as necessity prompted or convenience served.

The first influx of the blood of the sea-kings into our country came with the

landing on the Isle of Thanet of those bold marauders, Hengist and Horsa. The country was then in a very disturbed state. Rome, pressed hard by Alaric the Goth,



The arrival of the Saxon fleet under Hengist and Horsa.

was tottering to her final fall and ignoble ruin; her forces were needed at home, and were recalled from Britain and her other outlying colonies. Then were the Britons in a dire state.

Those desperately hard fighters, the Piets and Scots, poured into the country. Used for nearly five hundred years to having their battles fought for them by the Romans, the Britons knew not whither

The Sea and its Story

to turn for protection: in their despair they hired the Saxon pirate fleet.

For the unhappy Britons this hired navy proved a thorn in the flesh, for having defeated the northern tribes, they proceeded to settle on the land they had delivered, and in this business they were helped by an almost continuous stream

Fierce and Splendid Seamen of pirates from the Baltic and the North Sea, fierce fighters

and splendid seamen, whose swords and axes held a place in their affections second only to their "long-ships" in which they dared the sea. In a hundred years the Britons had been driven northward after the Piets and Scots and westward into Wales and Cornwall, and the vast fertile plains of England were populated by a people who, whatever their adopted avocation, had the call of the sea in their ears and the love of the sea in their hearts.

In the homesteads they had built for themselves on their captured lands grandfathers would tell their children's children of the "ships" in which they had first come to the shores of England, long open boats two hundred and more feet from the dragon at the prow to the steering oar. They would tell tales of the rattle of the Britons' futile stones on the red, white, and blue shields hung along the gunwales to protect the rowers at the sweeps, and then the tale would go even farther back to the days when the sea gave them what they needed to live—provided that they were strong enough to take it at the point of the sword, when long-ship met long-ship or trading galley, in the wind-lashed fury of the North Sea's rushing tides.

Thus was the love of the sea kept alight in the hearts of the Island people.

To Alfred the Great the history books usually give the credit for organising the first actual navy to be built and manned from our shores, but in this case the historians have probably drawn on their imaginations for their facts, for there is no evidence that Alfred took any active

steps to repel the horde of Danes who descended on his realm, until they were actually landed. The truth of the matter is that some of the shore-dwelling Saxons banded together, manned their fathers' old long-ships, and built and manned new ones to repel the Danes. This volunteer navy failed, but failed gloriously: it was overborne by the rushing tide of invasion, and England was once more overrun with sea-fighters.

But the navy did not die, though it had been swept aside. The Danes themselves, as they gained footing and possession, assisted to maintain it to prevent the inroads of others from the North Sea. The ships were improved to give them an advantage over the long-ships that came from the north and east. Platforms were built in the bow and stern to protect bowmen and slingers, and to enable them to shoot downwards into the un-decked craft of their enemies.

A hundred years later danger threatened from another direction. William of Normandy, descended from Rollo, the Sea King, the greatest seaman and most dare-devil pirate of all those who devastated the North Sea in those early days, cast his eyes on England and was not deterred from invading it by the fact that Harold could muster a fleet of two thousand ships in the Channel.

With the coming of the Normans the military, as opposed to the naval, spirit began to dominate the nation, and the ships of war were developed to enable them to carry a large number of purely military fighting men who took no part in the actual working of the ships. The fore and stern platforms were extended and enlarged into something like the "castles" that were to come a little later. At the top of the mast, looking singularly like the fire-control stations of our most up-to-date battleships, were other "castles," which at the time of battle were filled with bowmen.

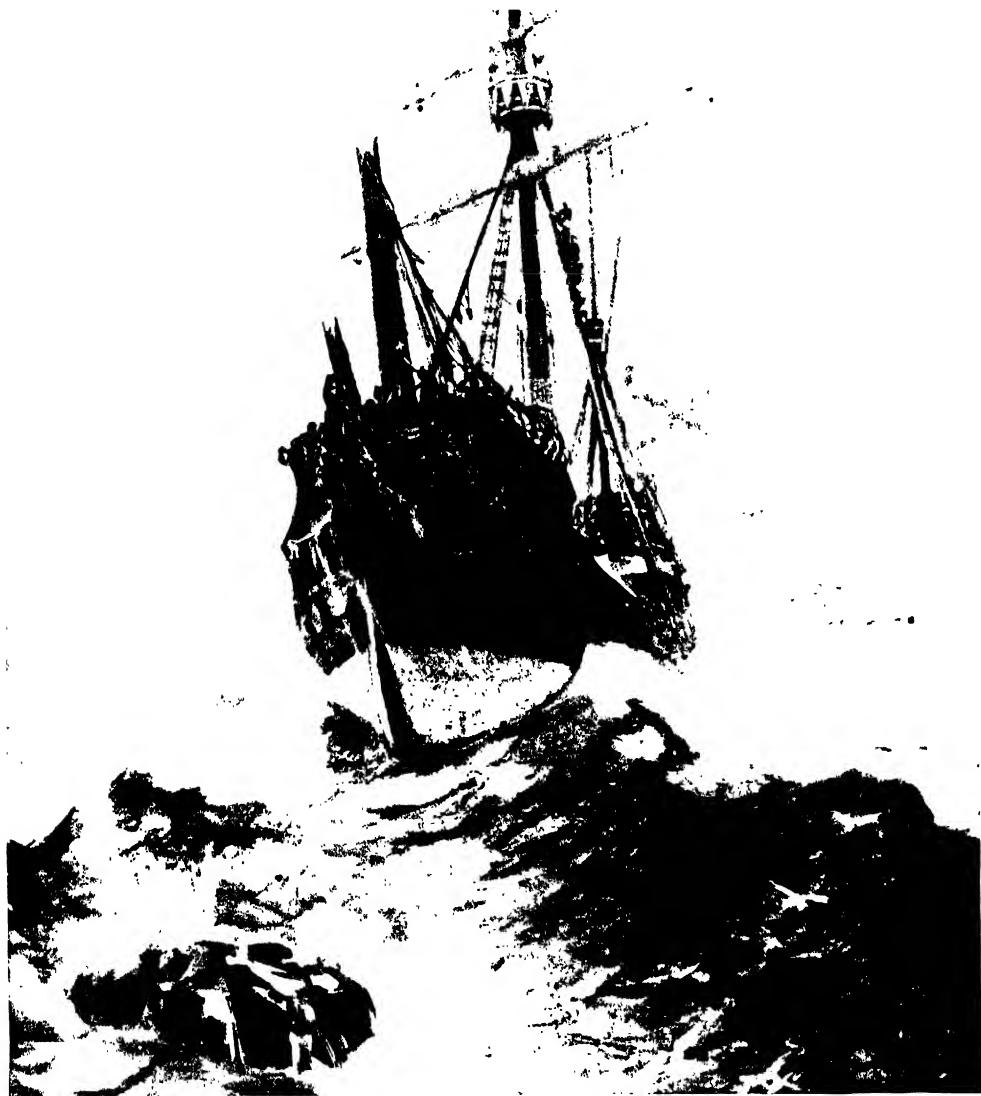
In the reign of that unhappy Plan-

**Ships of
the Norman
times**

tagenet, John, came the first of our great sea victories and the first pitched battle in the age-long fight between the English and the French for the mastery of the

every one of them. The admiral on that occasion was a Lord Salisbury.

The navy continued to grow, even though it was hampered by a necessity



Fleeing hot-foot from her nimble enemies, the last great ship of the storm-driven Spanish Armada dashed to her doom among the rocks of the Outer Hebrides.

sea. The engagement was short and sharp. An English fleet of some four hundred and eighty ships fell upon a French fleet numbering close upon fifteen hundred, and captured, sunk, or burnt

of conforming to military conditions. Ships of war came to be more and more considered as mere platforms for carrying a large number of soldiers who, clad as they were in heavy armour, were next

to useless in anything of a sea. Poops and fo'castles grew and grew until it seemed that seaworthiness was one of the



A "long-ship" of the Vikings.

last things considered in designing a ship. In the reign of Edward III. so little was our navy feared that the Scots and French developed a kind of naval game which consisted in snapping up English merchant ships and taking them prisoners from under the very bows of our fleet.

The roses of Lancaster and York had faded from the pages of history before any improvement came. The Tudor Henry VII. did something to mend the sad disrepute of our war fleet by causing the *Great Harry* to be built. She cost something like £14,500, and was the first ship of the royal navy proper—the first ship to be built and manned solely for the King's service. Of the next Tudor, Henry VIII., we know little that is good; but whatever his morals, he certainly loved the sea and understood something of the naval needs of an island nation. To his lasting credit it must be set down that he freed the navy once and for all from the grip of the military authorities and made it the first line of defence.

To Henry VIII. we owe the *Henry Grace à Dieu*, a "Dreadnought" indeed, a veritable giant among pygmies, for she was of

over a thousand tons (old measurement), and in those days a vessel of two or three hundred tons was considered large. She must have been a picturesque sight as she swung to the heave of the Channel, her beautifully painted sails bellying and her fifty flags and banners streaming in the wind. She was the first ship to have more than one tier of guns, and her two decks, from the lower of which the guns were fired through portholes, marked an epoch in naval history.

Even though there was now the beginning of a real Service, there was no regular line of demarcation between the navy and the merchantman, or rather between the navy and the adventurer. England was beginning to feel the commencement of that tremendous burst of enthusiasm for discovery and pioneer work that was presently to place her in the forefront of maritime nations. The names of Englishmen, Sir John Willoughby and Richard Chancellor, took their places, in the middle of the sixteenth century, with those of Cartier, Magellan, Cabot, and Columbus, and the seamen of the nation and the nation itself were beginning to cast wondering, greedy eyes upon the languorous



An Elizabethan Pirate looting a Spanish Galleon.

luxuries of the spice-breathing East and the golden glories of the recently discovered West. Spain and Portugal held

these delectable regions between them; and, to the North, Willoughby had found only snow and ice and a very great cold; what was left for the mariners of England in search of adventure but to twist the beard of Spain and prick the heels of the "Portingale"?

At this game none excelled the hardy ruffians of Devon, and great was their reward in silk and gold, in wine and curious raiment, in doubloons and pieces of eight. Pirates they were without doubt, but what pirates! Adventuring forth in their tiny vessels, they met the fat treasure ships of the Don wallowing home from the Indies or Peru, and harried, burned, sank, and captured them, daring tremendous odds and unheard-of dangers to wrest some little of the wealth of the newly-discovered lands to their own use.

The success of the men of Devon found them many imitators, who learnt at their curious calling all the requisites of fighting sailors. When Elizabeth came to the throne she had among her subjects as hardy and dare devil a body of sailors as could be found anywhere, and but a short time after she assumed the crown the smouldering tinder burst into flame

hand, and though they were pirates at heart and pirates in practice their names are honoured, and justly. Drake, Fro-



The Sovereign of the Seas.

bisher, Hawkins, Grenville, they all stand for something big in the making of our navy; they are types of the men who laid the foundations of our sea power so firmly that it has hardly been shaken since.

In 1587 Mary Queen of Scots died by the axe at Fotheringay, and Elizabeth, who had caused her death, looked across the Channel and saw the whole Continent bristling with the spears of outraged Spain. So James White picturesquely puts it in his "Landmarks of History."

Philip of Spain was no light enemy. From Peru and Mexico came into his treasury the riches of the New World. He was ruler of dominions on the Continent such as have seldom been united in one land. His ships covered the sea, his armies were drawn from every part of the world, and notice was given throughout Christendom that the Invincible Armada was destined to carry religion and justice once more to the "apostate" kingdom of England.

Elizabeth, nothing daunted, mounted her horse, encased herself in armour, addressed the English forces at Tilbury Fort in a noble and patriotic speech, and



A Dutch East Indiaman of Van Tromp's time.

and the whole country was alight from end to end with the desire for maritime greatness. Great sailors rose on every

The Sea and its Story

made the greatest preparations for defence. All along the shore from Cornwall to Dover, and thence to the mouth of the Humber, from Land's End to the Solway Firth, beacons were kept in readiness on every hill. One touch of the lighted brand would send tongues of flame to announce the enemy's approach from

The Rout of the Armada one end of the kingdom to the other. A strong body of men

was kept near the capital; fast sailing ships were dispatched to scour the seas and bring notice of the coming of the Armada. Meanwhile the English fleet, composed of small and light vessels, mostly volunteers, cruised off the southern coast.

At last, on a certain day in October, 1588, the sea became alive with ships. Squadron after squadron in interminable array had gathered from the shores of Belgium and Spain and Holland; an enormous army of the best soldiers in Europe were embarked in the accompanying transports. But a storm began to blow; the ships that crowded the narrow channel were shocked against each other; the English navy, rushing out from under the lee of the land, poured their batteries into the labouring hulls of the Spanish fleet, and escaped the return cannonade by the diminutiveness of their size. Unwieldy, scattered, disheartened, the Spanish galleons could neither ward off nor escape the unceasing assaults of these interminable foes.

Two or three little vessels would make a dash at an enormous three-decker of the enemy and force her to haul down her colours. From every bay and inlet out sailed pinnace, barge, pleasure boat, and fishing coble, filled with volunteers, who did all the execution they could. No man on all the coast was satisfied without having had a shot at the Don. In the meantime the storm blew fiercer and fiercer. Over the tops of the highest waves floated ever and ever England's terrible fleet, pouring broadside after broadside into the half-shipwrecked foes.

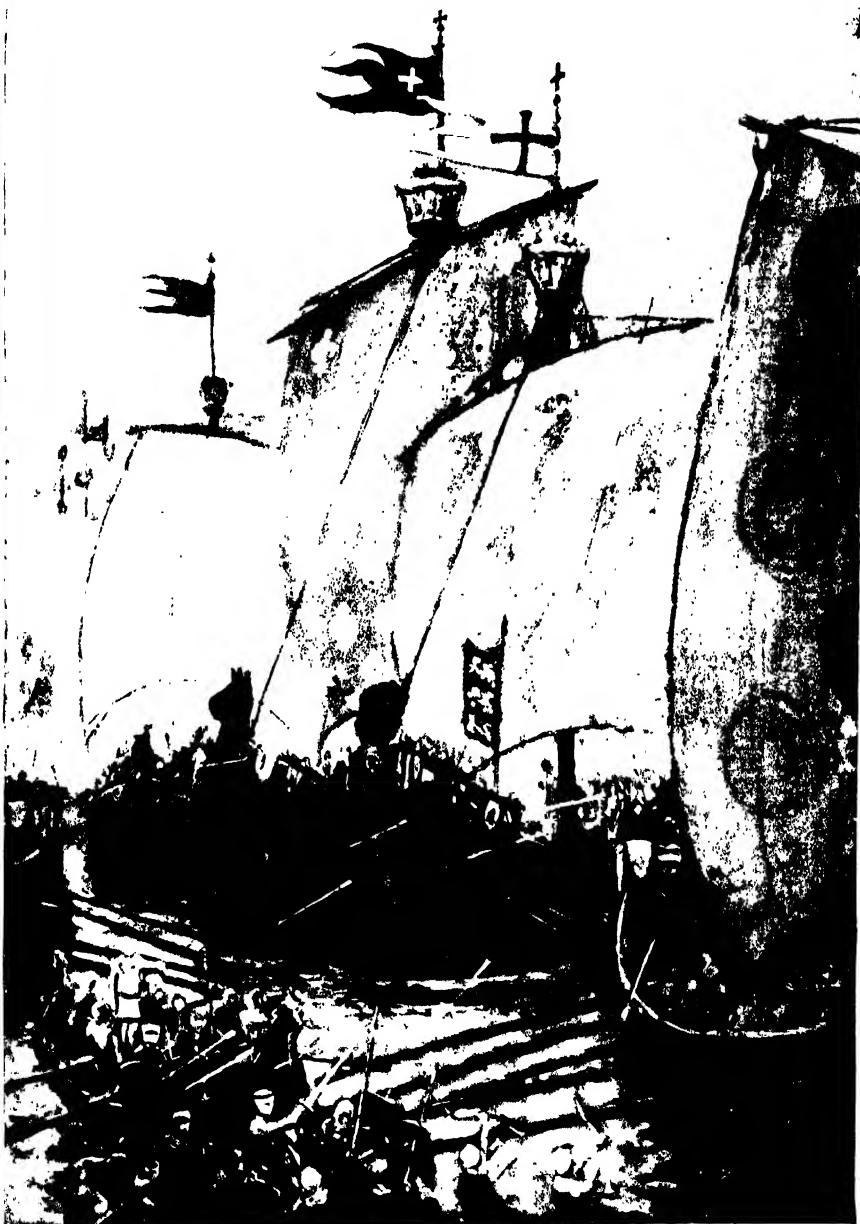
Able neither to handle their vessels in such weather, nor to elude the enemy's pursuit, despair at last took possession of the Invincible Armada. Some ran themselves on shore; some put up all sail and fairly took to flight, and all that was heard of the unconquerable fleet and innumerable army were reports which from time to time came in, that a squadron had foundered off the coast of Scotland, that another had been wrecked off the Northern Isles, and, finally, that a small remnant had found its way, after many months, into its own ports, and that England was free from all danger of an invasion.

So much for James White's account of an event which finally proved, to English minds at least, that a navy, to be successful, must be manned and fought by sailors. The battle also served very materially to strengthen the position of the professional navy as opposed to those glorious free-booters of the sea previously referred to — and when Elizabeth died the Royal Navy consisted of forty-two ships, sixteen of which were over six hundred tons burden. This war scarred fleet, its hulls impregnated with the salt of every sea in Orient and Occident, its men learned in every ruse of battle or of navigation, was a fine nucleus for a man who had the instinct for navy building.

Such a man arose in the person of Phineas Pett, whose ideas made as great a revolution in naval practice as those of the "Dreadnought" builders are doing to day. He modelled the new navy into first, second, and third raters, and in 1637 he launched the

A Sovereign of the Sea, Great Naval Designer
a vessel whose tonnage exactly numbered the year of her launch and which carried a hundred guns.

Save for the activity of Pett, however, the Stuart times were bad times for the navy. Corruption reigned supreme, and the military party began to regain their hold. In the reign of Charles a fleet, overladen with soldiers, was sent to take Cadiz,



OUR FIRST GREAT NAVAL VICTORY.

The Battle of Damme, in the reign of King John, where the English fleet beat a French fleet that outnumbered them four to one.

It came back again without attempting to fulfil its purpose, being rotten with mismanagement and lack of discipline. The command of the King's ships was in the hands of those who had nothing but interest to recommend them, and who regarded the vessels of which they nominally had the command merely as sources of income by the peculation of the seamen's wages, or an occasional prize, the real business being done by a brave and resolute body of men who had risen from before the mast, and who were only too eager to meet danger and overcome it.

It is not our custom to think of Oliver Cromwell as a naval genius; but as a matter of fact he had the sea instinct of our sea-king ancestors strong in him, and did more to solidify the navy than any of his predecessors. He found, when he came to power, a navy of fourteen two-deckers and left one of one hundred and fifty vessels, one-third of which were line o' battle ships. He was the first to lay naval estimates before Parliament, and obtained £40,000 a year for the service.

mendation it was enacted by Parliament that no goods should be brought into this country save in British ships, or in those of the country from which they came.



Henry VII.'s Great Ship.

War with Holland followed as a matter of course, and our navy was soon put to it to withstand Van Tromp's gallant fighters. In the end we vanquished them, however, and one of the conditions of peace was "that the ships of Holland, as well as the ships of war of all other countries, meeting the ships of war of the Commonwealth in the British Seas, shall strike their flags and lower their topsails," a sign of homage to Britain as Mistress of the Seas.

Although Britain had to fight desperately for another hundred and fifty years before she finally substantiated her proud claim at Trafalgar, yet we may well leave the telling of that tremendous struggle for the command of the sea for more adequate treatment in later chapters. When Cromwell died the navy had passed out of its adolescence; it was standing firmly upon its feet, imbued with such vitality that neither political corruption nor public indifference could weaken it. It had come into its birthright as the first line of defence, and from that premier position it has never since receded.

ERNEST H. ROBINSON.



The Victory at Trafalgar.

At this time the Dutch were the marine carriers for the whole of Europe, which position Cromwell considered should belong to the country he ruled. Upon his recom-

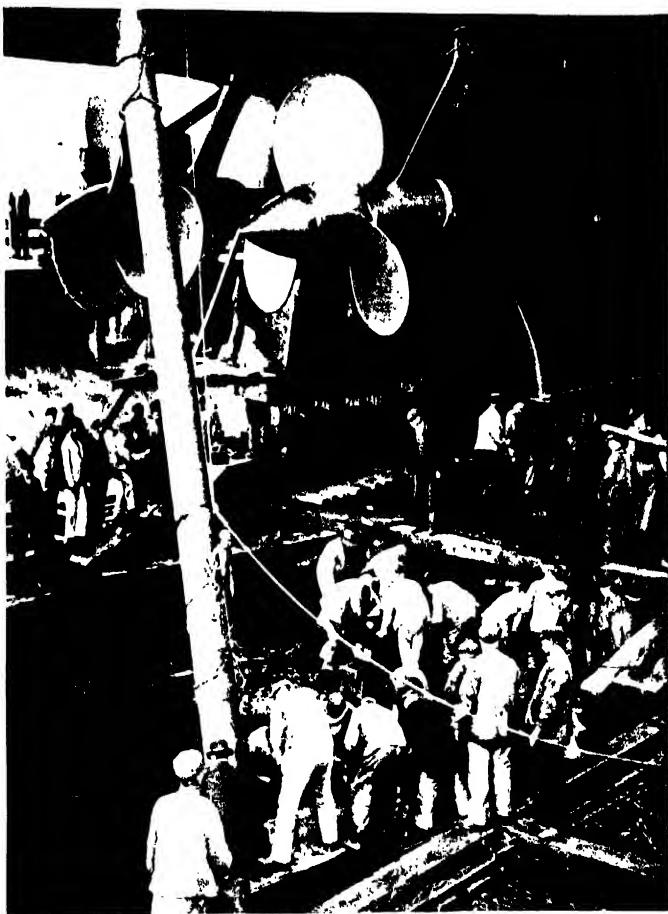
Wonders of a "Dreadnought"

A

LITTLE over four years ago the word "dreadnought" was just a single minute portion of the English language—a splendid atom, 'tis true, yet a little-used word in ordinary everyday conversation. On October 2nd, 1905, the keel was laid of a new giant ship, and from then until October 6th, 1906, hundreds of skilled men laboured upon the huge vessel that was to carry this word as her name, popularise it and make it entirely her own, until the man in the street knew it as the cognomen of a battleship of which every man is justly proud, yet few have seen; a less number still know anything about these ships, except that Britain requires them, that they carry huge guns and massive armour, and each costs over a couple of million pounds to build.

Of course, in time of war the battleships' part will be that of sturdy hard-hitters leisurely steaming in squadrons looking for the foes that it is the cruisers' job to

find for them. Therefore it stands to reason that to the nation with the largest number of the biggest, heaviest-armed, and armoured ships and the best personnel will fall the victory in the day of battle, and though we are to-day well ahead of the next nation, we must not stop in our hurried construction for one moment or even falter in our stride.



Prepared for launching.
Preparing to launch one of Britain's Super-Dreadnoughts.
The triple screws that will be driven by turbines are shown
in the picture.

To the lessons of the Russo-Japanese war we have to turn for the first conception of the "Dreadnought" type of battleship, and to the dreamings of one of Italy's greatest sons, Colonel Cuniberti.

For the building we must turn to those thousands of unnamed British engineers who for a year laboured without ceasing upon her huge fabric, meeting and overcoming difficulties that engineers alone can appreciate, and in the end making her and her younger sisters the wonderful successes they are.

At Tsushima, the great sea battle that sealed the fate of Rodjensvensky and his fleet, the "portmanteau," or twelve-inch shell, did more damage and caused greater fear in the hearts of the Russians than all the rest of the Japanese guns put together, notwithstanding the fact that the biggest of Togo's battleships carried but four of these weapons. This instantly caused the British naval architects to desert the type of battleship that had done duty for the last score years—vessels armed with guns of several sizes—and once more we returned to the all-big-gun type of ship that had been considered the correct type during the '80's and '90's of the last century, and commenced a race in construction without parallel—a race that has caused the *Dreadnought* to already become partly obsolete, and, great fighting unit as she is, to no longer be able to keep true to her boastful name. As a further indication of the swiftness of the race it must be remembered

**The Reason of
the "All-big-
gun" Ships** that not only this country but alien powers have constructed bigger ships, and as a last straw the service to which she belongs has placed the prefix "old" before her name.

Having now traced the cause of her birth, her building, and mentioned her old age, let us leave the *Dreadnought* and take a nearer peep at one of her massive sisters and see what this ship means in

size, power, and money, and observe the wonders of this powerful fighting machine. Covering her towering sides, under their grim coating of grey, lies her armour. Right from bow to stern, from main deck to under the water-line, this Krupp-hardened steel hide extends, eleven inches thick amidships, tapering to six inches at the bow and four inches at the stern, weighing about five thousand tons, for which the rate-payers have had to expend £120 a ton.

How our Ships are Armoured and Protected

In this chilled-steel coat we have the maximum of strength for the minimum of thickness ever obtained in the creation of steel. Six inches of this same armour plate equals and even exceeds eighteen inches of solid wrought iron as carried by our armoured ships in the middle of the last century. Added to this side armour is the protective deck that is built into every modern battleship and cruiser and extends the whole length and breadth of the ship, practically cutting the ship clean in two just above the water line and protecting the vitals from the infliction of any injury by the dropping shell. In some big vessels there are two of these decks, which vary in thickness from one inch in the light cruisers to six inches in the modern battleship.

Further to protect the sides, the coal bunkers have been so arranged that when filled they offer a very substantial addition to the ship's armour; whilst at the bottom there are practically two skins, one inside the other, so that if the outer hide is pierced by torpedo or mine there is still a second skin to be forced before any water can enter.

Having thus observed the outer walls of this moving floating citadel, clamber up the gangway, past the phlegmatic marine, and turn your eyes upon the spacious deck and towards the ten great weapons that constitute the offensive power of the ship, where, in strange contrast

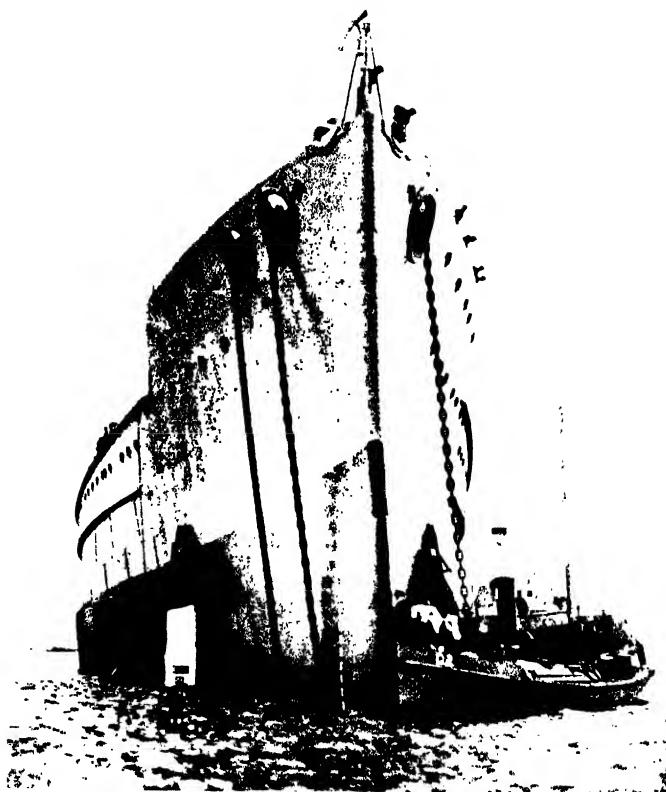
Wonders of a "Dreadnought"

to their grim, massive strength, a small human a mere midshipman - is gaily roller-skating at his ease.

Here, in these big guns, lies the greatness of the ship; never before have vessels of war carried so many mighty pieces of artillery. From their snouts, with a bore twelve inches in diameter and rifled, they are able to throw shells weighing seven and a half hundred-weight at the rate of nearly three thousand feet a second, and with such terrific force that at nearly two miles' distance the huge projectiles could smash their way through a solid piece of wrought iron over a yard in thickness. And these same guns could at extreme elevation bombard St Paul's Cathedral from Croydon. Contrive to crawl below and thence into the barbette (there are no doors here) and look around at the wonders of this steel-walled pen, dimly lighted and protected by a coating of steel eleven inches thick. Before your eyes are the runners and breech mechanism

of one great gun. Firing the Big Guns the other is hidden by a dividing shield.

Upon these runners the great gun slides with the recoil, and is forced back into firing position again by the hydraulic cylinders hidden below. Observe immediately behind the breech of the gun the ammunition hoist, that brings the great shells up an armoured miniature lift from the magazine far below, and



H.M.S. *Neptune* just after her launch. This fine picture gives a good idea of the vastness of a modern battleship.

pushes each projectile with silent, easy motion into the breech of the gun, which has already opened its capacious maw after the last discharge, thrown out the remains of the last cartridge, and had its bore cleaned by the compressed-air blast that acts the part of the sponge of former days. Then, as the breech closes once more, and with a half turn of the wheel is screwed tight and tested by the half-naked men that labour here with strained eyes and plugged ears, the man in the sighting hood, whose puny legs show in striking contrast to the mighty gun, takes the sight through his telescopic devices, and, moving the gun as if it were a toy, assisted by the neat hydraulic and electrical forces chained to his will, touches the contact, and with

an awful roar of sound, a terrific back-blast, an eddy of eyesight-destroying vapours, the shell goes howling and screaming through the chill wind. Before we gingerly leave the barbette, turning in its entirety noiselessly upon the circular steel rails and puny-grooved wheels, we must not forget that this same ship carries four more of these, each containing its two monster guns, each weapon well able to send a shell hooting away every minute that passes, until the vast store of eight hundred twelve-inch projectiles carried in the ship's magazines are exhausted; then, as we come out again in the open air, just consider the awful smashing power of this great steel thing.

Though we have been shown the main armament we have not seen all her hitting force. The thoughtful constructor has to protect this massive battleship against the onslaughts of torpedo craft, and accordingly has liberally sprinkled four-inch quick-firing guns on the barbettes and in the superstructure. Each of these smart little weapons is fed with its separate ammunition hoist, each is able to spit steel death of over a quarter of a hundredweight at fifteen shots a minute, each has its new swivel mounting and can be swung with ease in any direction, and each is supposed to be a better weapon than the 47-inch guns that made history in South Africa.

Next glance at the carefully draped searchlights, covered in their tarpaulin mantles to protect their delicate mechanism from the weather when not employed. Of these a "Dreadnought" will

**The
"Anti-torpedo"
Armament** carry eleven, two of them being huge powerful instruments with faces a yard in diameter and well able to throw a beam of light a dozen miles. All these lamps are for searching the darkness for the lurking torpedo-boat—the dreaded enemy of the greatest battleship—and are so placed that four can be concentrated upon any given point, and yet without the glare inter-

ferring with the sighting of the four-inch guns; and, further, each has been connected electrically by a special system of control with the range-finders high on the masts and with the group of guns they serve, so that the search-light operators on the high bridges and masts are always in connection with the men that stand grimly behind their weapons in the gusty darkness, waiting for any suspicious object on the surrounding sea.

Night dispersing lights

The protection does not end here. Look over the side, and observe the long row of steel booms that nestle against the bulging side, and note the roll of stout wire netting that is bundled so snugly on the ledge extending from bow to stern on either broadside. At the one word of command an engine would jump into instant life, a winch would commence to turn, and ere the word had echoed away the booms would be standing out at right angles to the vessel, and a curtain of steel mesh would be enshrouding the hull in a veil against which the leaping, darting Whitehead could only kick in vain.

The big battleship, so fearful of Mr. Whitehead's terrible invention, is not above using the torpedo as a weapon of offence herself, and far below, deep under the sea, are her four firing tubes, with their delicate hydraulic and electrical equipment which cost the country three thousand pounds apiece, whilst the torpedo which they fire costs a further £600 each.

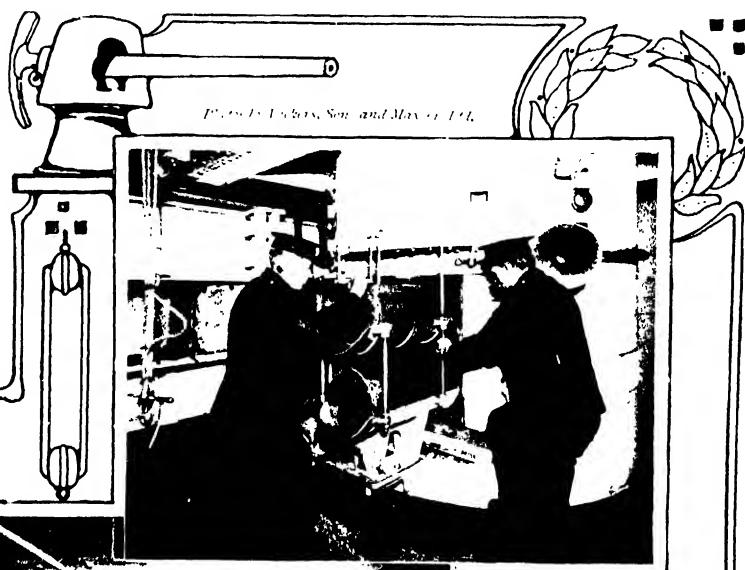
Now we have, in theory, viewed the offensive and defensive armament we will observe two small things that have before now escaped our attention—the small square boxes a hundred feet above the decks at the apex of the straddling tripod masts. Within these insignificant little hatches are the very brains of the guns. Architects and engineers have constructed this magnificent fighting machine and protected her vitals in every possible way from bow to stern, from upper deck to keel. Inside they

have woven a network of wire, small, hidden, and in size insignificant, yet leading away up to these boxes high overhead, and there centring in what is generally known as the "fire-control station."

Here, in the day of strife, surrounded by small devices for accurately telling a hundred quiet little tales to those that know and understand, will be stationed the men who will tell the gunners cooped in the barbettes the tale of the gun's doing. The men whose voices in faint electric whispering from above will give knowledge of *their* speed and our speed, of the range, the result of the sighting shots, and a hundred and one other items of the greatest importance, and

yet this box, high in the whistling wind, pitching in wild parabolic curves to every roll of the mighty ship, constantly vibrating to the thud of her propellers and machinery, is totally unarmoured.

If possible, endeavour to clamber up the mast to this airy perch and there look down upon the panorama of the ship spread out below—the great array of guns, the mass of ship's boats clustered on the superstructure, the puny humans busy at their numerous duties, the two



Perris Brothers, Son and May, 1914.



The shells are taken from the bin by a travelling gripper and conveyed to the hoist.

The top picture shows the powder room and the hoist which takes the cordite charge to a pair of 12-inch guns. Four cases of high explosive the size of the two shown in the picture make a charge for one gun. The shells also go up the same hoist from the room shown in the lower picture.

great oval funnels vomiting a sable cloud, and the cushion of foam round the bows and the long, broad ribbon of boiling wake. Observe the quiet, keen-faced men stationed at these delicate fire-control devices, so delicate that they are constantly going wrong even in time of peace. And yet so quick and accurate when they are at work that the man behind the gun relies on them implicitly, and by their aid makes marvellous shooting records. Nowadays the men in the fire-control stations make no mistakes, as was their wont in the old days of the miscellaneous armed ships, when they would often read the result of a twelve-inch shot as that of a six-inch and vice versa. With all big guns this error is non-existent.

Knowing, as you do, that these fire-controls are the very eyes of the ship, try for one second to imagine what would happen if with one well-aimed shot all this box of tricks were brought crashing to the decks. Would the men cooped in their steel-walled citadels arise in the hour of need and, throwing off all the fetters of custom, fight their guns each for himself, as they did in the days before centralised control; or would they, with the information they had been taught by gun-layers' tests and battle practice to rely upon suddenly taken from them, become disorganised and fire aimlessly at sea and sky? The question cannot be answered. Though we are now placing our fire-control stations behind armour in the latest ships those that understand know what a terrible risk we run to-day.

Before "diving below" squeeze inside **In the Conning-tower** where the captain and navigating officers are supposed to remain in the day of battle. Observe the numerous speaking-tubes and electrical devices for carrying the word of command to every portion of the ship. See the wheel where the helmsman will stand—and then recollect that during all the naval fighting in the Far East Admiral Togo never used his conning-tower at all,

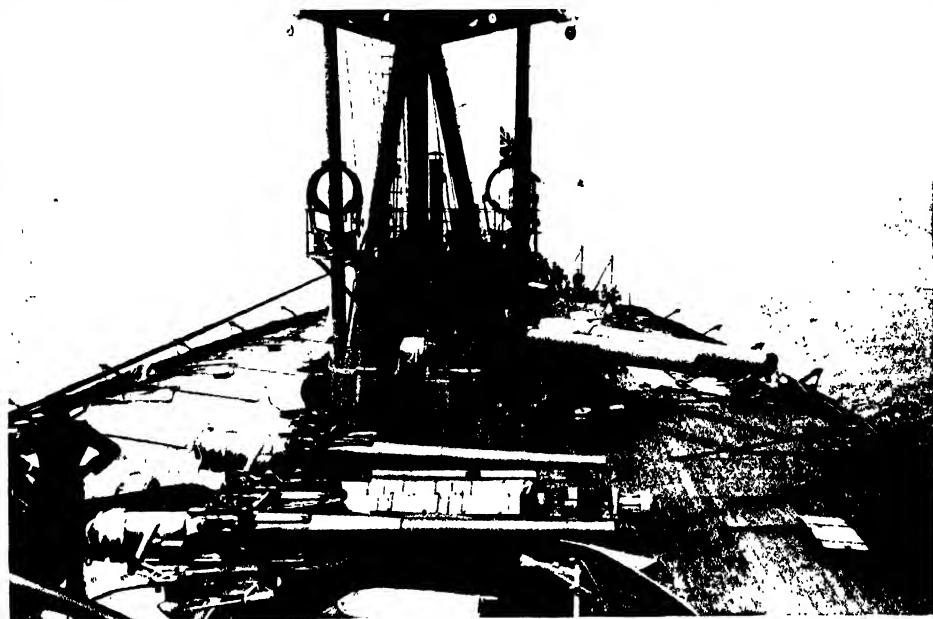
for he knew, as our men know, that this heavily armoured position is one of the bull's-eyes for the enemy's fire, and is not only a dangerous spot but also sadly restricts the vision of those within.

Now we have considered the destructive portions of the ship, let us see how her crew are housed, how she is propelled, and how her engines are fed.

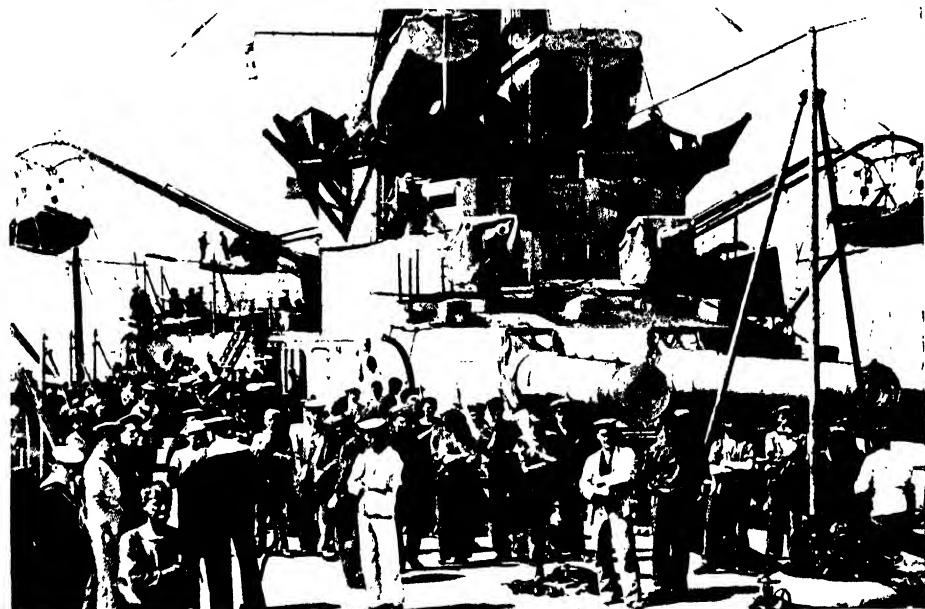
A Mighty Floating City

Right under the bridge are the cabins of the captain, quietly furnished snug quarters, where as a supreme monarch he dwells in solitary state, ruling this throbbing world of between seven and eight hundred men, youthful, British, and disciplined to the highest degree, experts at all the positions they occupy in this pulsating floating city that can be measured with a length of five hundred feet, an extreme width of eighty feet, and a depth of forty feet. Immediately below the captain in rank comes the commander, whose duties are as numerous as the stars, extending from the most trivial of items to the ordering of an evolution that will exercise the whole crew of the ship. Then, from the commander we come to the lieutenants in all their varied grades and years of service, from "No. 1," as the service generally call the first-lieutenant, to the sub only just promoted from a midshipman. These subs are the dividing line between the ward room, where all the senior officers have their meals each having his separate cabin—to the gun room ruled by the senior sub-lieutenant, which is the home of the junior officers, and where youth rules and noise and laughter is little affected by the huge death dealing machines around them, and where the private cabin disappears, and from this grade downwards all live together in their different ranks.

Before leaving the officers we must not forget that there are those who rule the Royal Marine Artillery and Royal Marine Light Infantry detachments which are carried in all our big ships. Those officers that don the neat blue and red uniform of



The deck of H.M.S. *Dreadnought* "cleared
for action." Contrast this with—



The quarterdeck of H.M.S. *Indomitable* after her
record trip across the Atlantic.
Photo: Stephen C. Clark

BATTLESHIPS' DECKS IN WAR AND IN PEACE

The Sea and its Story

the R.M.A. are some of the most expert gunners in the ship, and their commanding officer will be found in that important box on the mast when the "real thing" comes.

The R.M.L.I. (that magnificent sea regiment) have their own duties to carry out, and guarding the magazines, forming guards of honour, acting sentry at the gangways and guarding the clothes flats are a few of their numerous duties.

Next comes that great class of expert men, called by many the backbone of the fleet—the non-commissioned or warrant officers, middle-aged men who by sheer merit have risen from the ranks and become, every one of them, a keen expert in the particular branch of the great machine he has made his own, and below these that magnificent class, the British bluejacket—those fellows who count for everything even in these days of electricity, steam, and hydraulic power the men who have been taught the virtues of patience, discipline, and hardihood which have made them what they are and what throughout history they have ever been. In their hundreds they live aft under the quarterdeck, that for generations has been, until the coming of the revolutionary *Dreadnought*, the promenade of admirals, captains, and officers. Cooped up in the stuffy flats, they sleep from the call of the boatswain's pipe at 9.30 p.m., ordering "Out Lights—Pipe Down," to the early hour of 5 a.m., when once more that same pipe bids them rise, stow hammocks with the regulation seven turns, and go to breakfast, before getting to work swab-

The Men who Work the Ship bing down decks, which commences the regular routine of another day.

Here, six hundred strong, they live and are fed from the huge galley carried by a modern battleship, served by the cooks and cooks' mates, and having their meals in any odd corner not absolutely filled with death-dealing machinery. Their ratings are numerous, and the branches of work they carry out bewildering—signalmen watch-

ing the signals with an eagle eye, smiths, armourers, plumbers, carpenters, electricians, sick-bay attendants, stewards, cooks, artificers, and stokers are all carried within this mammoth, beside those naval police that carry out the same duties on board ship as our own constabulary execute ashore. In conclusion, before leaving these fellows and getting farther down into the bowels of the ship to the realms of the engineers, we must observe the perfect order and readiness for that prime duty of the ship which will come on that day when the cloud of the enemy's smoke shows like a grim black pall upon the far horizon.

Waiting for "The Day"

Now, with trepidation, we remember there are great lengths of nearly perpendicular iron ladder to be negotiated, where the reek of hot oil comes in noxious whiffs from the dark pit below. Descending them we venture inside the great clean, orderly, and almost silent engine-room, peep at the turbine drums showing no movement without but within whirling the "rotor" at enormous speed. Over the whole rule those quiet fellows with the purple slip between the gold on their sleeves—the purple slips that mark them as engineers.

Under the engineer-commander and his lieutenants are the various grades of artificers and stokers that drive not only the turbine engines that push the ship ahead at over twenty miles an hour, but the dozens of minor clattering intricate machines that supply the electrical current, that work the steering gear, that turn winches and capstans, keep cool the magazines, supply fresh water, and execute a score of different jobs; also we must not forget there are twenty boilers constantly requiring attention, and all the intricate tubes that carry the steam at enormous pressures must never for a moment be forgotten or the dreaded accident, with the court-martial to follow, will be sure to come.

Let us leave the neat engine-room that seems so plain after the mass of cranks

seen in our ships before the "Dreadnought" era, and by crawling down dark, heated passages come to one of the stokeholds. There we may see down the narrow alley the half-naked stokers before the gleaming furnace doors, ever feeding the monster that eats coal at the rate of fourteen tons an hour. Taking courage

waters of the North Sea. If you are curious and have not seen enough, clamber lower down into the double bottom where the oil fuel is stored (rough, crude petroleum) that aids the coal when an impatient admiral requires an extra burst of speed.

Now clamber and crawl from deck to



The wonderful "working chamber" from which the ammunition supply of a pair of 12-inch guns is manipulated. From this room, which revolves with the guns, they can be trained by hand should the electric or hydraulic gear be damaged.

in both hands let us peer at the bunkers, ranged tier above tier within the sides of the ship. Craw1 in and see the haze of coal dust, as the grimy humans shovel and shovel in the semi-darkness. Look with wonder at the trolleys, filled with the shining steam coal, pushed by men guided by the rays of their Davy safety lamps, and then think that this miniature coal-mine in active life is no hole in the earth's crust, but a product of man, speeding over the grim, rolling

deck towards the light; first turning aside to view one of the big-gun magazines, where the marine stands stolidly at the door, observe the serried rows of great shells, the patent hoist that moves them to the tray of the small lift that carries the monsters up to the barbettes far above—every item is in place. Every precaution has been taken to avoid premature explosions, and the room is kept but a few degrees above freezing point by the

The Sea and its Story

refrigerating plant for cooling the place. Take a further walk along the clean lower decks, and look into the neatly arranged sick-bay—which is the naval term for the ship's hospital—fitted up with the latest thing in swinging cots (there are half a score of them) and the finest surgical plant obtainable. A cheery

The Neat "Sick-bays" place, well lighted and ventilated and served by a staff of uniformed, expert male

nurses, as great a contrast as is possible to those grim cockpits which performed a like duty in the ships of Nelson's Fleet. Yet as we leave this place we cannot repress a shudder when we think of what we have heard of these places in actual war, as described so graphically by eye-witnesses upon the Russian vessels at Tsushima.

As we again clamber upwards do not forget to observe how the ship is divided in small sections with doors of massive strength all fitted with electrical and hydraulic plant, so that by the mere touching of a lever on the bridge these doors would instantly close and divide the ship into so many small parts that even if one or more were completely filled with water the ship would still quite easily keep afloat.

After taking one fleeting glance at the wireless telegraph operator busy sending and receiving his messages in a quiver of blue crackling electrical discharge, and watching the busy sailor with the receiver clamped over his close-cropped head hard at work in the ship's telephone exchange, we will once more reach the deck and take a good gulp of fresh air after the various atmospheres we have sampled within the mammoth hull.

Look up and observe all the varied types of small boats she carries, from the steam pinnace and barge down to the little collapsible Berthon boat, and catch a glimpse of the lifeboat hanging well out on its crooked davits ready for the fairly common cry of "Man overboard."

Now the gangways are at hand and we must leave this floating microcosm. Though this article has attempted to describe some of the wonders of our mightiest ships, yet again only the eyes and brain themselves can, by witnessing all this, thoroughly understand it, and appreciate what awful death-dealing monsters these ships are. To view them at their best, go to sea with them when the wind rakes up the big green rollers and tosses mighty masses of foam against the ram, throwing the flying haze of glistening spindrift high as the bridge, and causing the nineteen thousand tons to roll in a thunder of surf, showing the gentle curves and beautiful lines that are hidden when she squats at anchor in some placid harbour, looking nothing less than a grim gun platform, with no beauty of form except in the frowning look of her massive power. Yet, behind all this tangle of steel, these latent forces of steam, electricity, hydraulics,

**What a
and cordite, are Men : "Dreadnought"
and in the day of strife
Means**

it will not be upon this great sullen fabric we shall have to depend for keeping our mastery of the waters, but upon these clean-shaved fellows, that we have caught young and trained to their present high standard of efficiency. After all it is upon our "Dreadnought" men that we must count.

HORACE G. DAVIS.



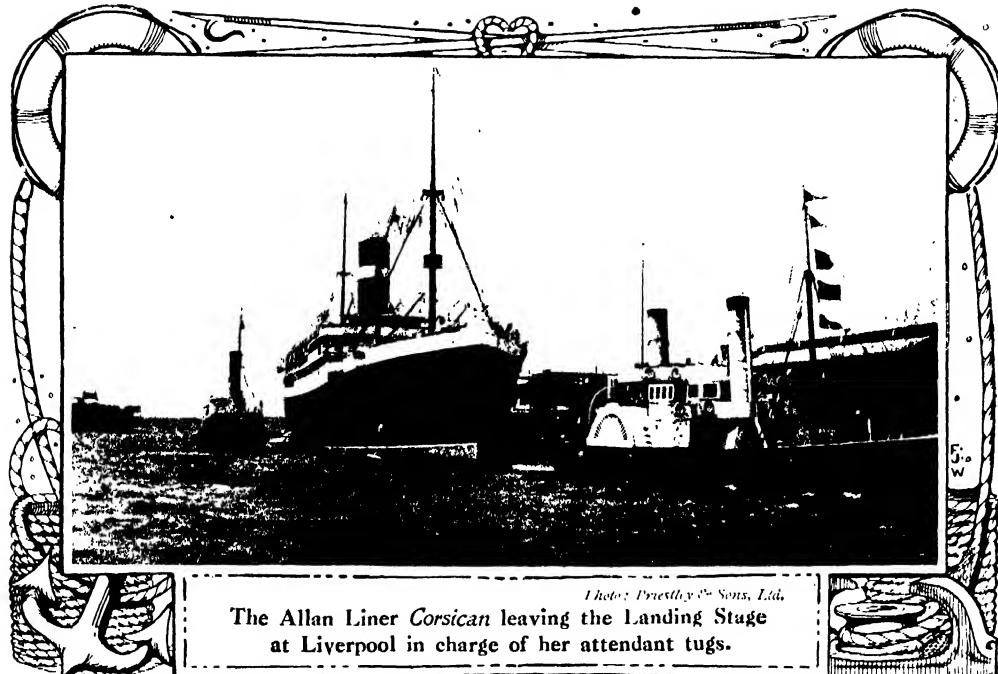


Photo: Priestley & Sons, Ltd.
The Allan Liner *Corsican* leaving the Landing Stage
at Liverpool in charge of her attendant tugs.



“Blue Peter”

In the International code of signals the flag with a white centre and a blue border merely stands for the letter “P” when hoisted in the company of other flags, but once it is run up at the fore-mast-head of a ship it takes on a new and great importance, for it means that before the day is done the ship flying the signal is about to cast loose from the trammels of the shore and fare forth into deep water once more. So the insignificant “P” becomes “Blue Peter,” and under its shadow very much of interest takes place.

For the departure of a steamer is no inconsiderable matter. The passenger who trips across from Liverpool to New York,

going aboard at the landing-stage, and landing at the dock, sees nothing of the thousand and one preparations that have been necessary to enable him to set foot on a clean, orderly deck. To him the journey is no more than stepping into the carriage of a train. Once he is safely installed on board a bell rings somewhere and the great ship moves serenely away from the stage towards the open water. In the interval that has elapsed since the vessel reached port a good deal of work has been done.

Once she has passed through the dock gates into the quiet waters she falls into the hands of a crowd of skilled men, all experts at their various occupations. By them she is cleared of her cargo first of all, and once the last grain of freight is clear

she becomes eligible for outward work. Nowadays, what with competition, there is little time lost in port, for a ship is idle there ; she represents so much un-earning capital. Therefore it is to the interest of all concerned to get her away as fast as possible, supposing that she is not a regular mail-boat with a

scheduled sailing date.

The Business of Making Ready

First of all, supposing she needs it, she is taken into dry dock, where she is cleaned of the accumulations of weed and shell fish that have grown to her sides in tropical waters. Then she is painted, and her tail-shaft and propeller are examined for any signs of damage, after which she is towed back to the wet-dock, and the process of making her ready for sea begins. Her first journey is to the coal-tips, and here her bunkers are filled. She is dragged under giant cranes, capable of picking up a whole truck of coal at a time, and the thunder of falling fuel is incessant. Coal lies everywhere, it is piled up against her funnel, her bridge rises wondering from a sea of black diamonds. Down in her bunkers men are slaving perpetually to keep the trimming shoots clear, for the crane drivers know that a certain amount of coal must be embarked in a certain time, and they are not desirous of lagging behind. So the trimmers trim, and the loaders load, until the ship has settled down considerably in the water, and her great bunkers hold coal enough to take her to whatever port she may be bound for, and probably to bring her back again.

Tugs now appear and drag her slowly from the shoots to the cargo-wharves. Her holds by this time have been carefully swept, and the dunnage-wood is piled in orderly fashion at each end of the vast spaces. Dunnage-wood is compulsory in loading ; it is arranged across the floors to a certain depth, grating fashion, in order that perishable cargo may be lifted above reach of damp. No matter that the steamer has a double bottom some three or four feet deep, dunnage must

be used, for the interiors of ships' holds "sweat" considerably, and there is usually some trickle of water from the sides. Hence the dunnage is neatly arranged by the stevedores, and when all is ready the cargo begins to pour in. This cargo may be anything. If it be railway material it has to be stowed very carefully, for steel rails have a bad habit of taking charge when the weather grows rough, and a dozen steel rails, each one weighing something like half a ton, can do a lot of damage in a very little while. Also, it may be that there will be half a dozen boilers, and these require to be handled circumspectly. Special tackle is rigged capable of bearing almost any strain, and the great cumbersome things are slowly hove from the wharf, dangled over the hold, and lowered to their resting places ; after which lashings are passed here, and wedging pieces are placed there, until the great package becomes for the nonce an integral part of the ship herself, practically a solid mass.

Winches clatter and hiss on deck over the other holds, and vast slings of general cargo pour aboard. Rattle-rattle-rattle goes the winch, and a sling is hove up to the outboard derrick. Rattle-rattle-rattle goes the second winch, and the sling swings inboard under the hatch-derrick.

"Lower away." Down drops the sling with the speed of light, and the hatchman directs the winch-driver by hand and voice until the workers below have slung the load to their liking ; then the signal is given to let go, and the cargo fall roar-s out. As it slacks, the sling is thrown off the hook, the stevedores

**Quick
fall on its contents
and Noisy
Work**

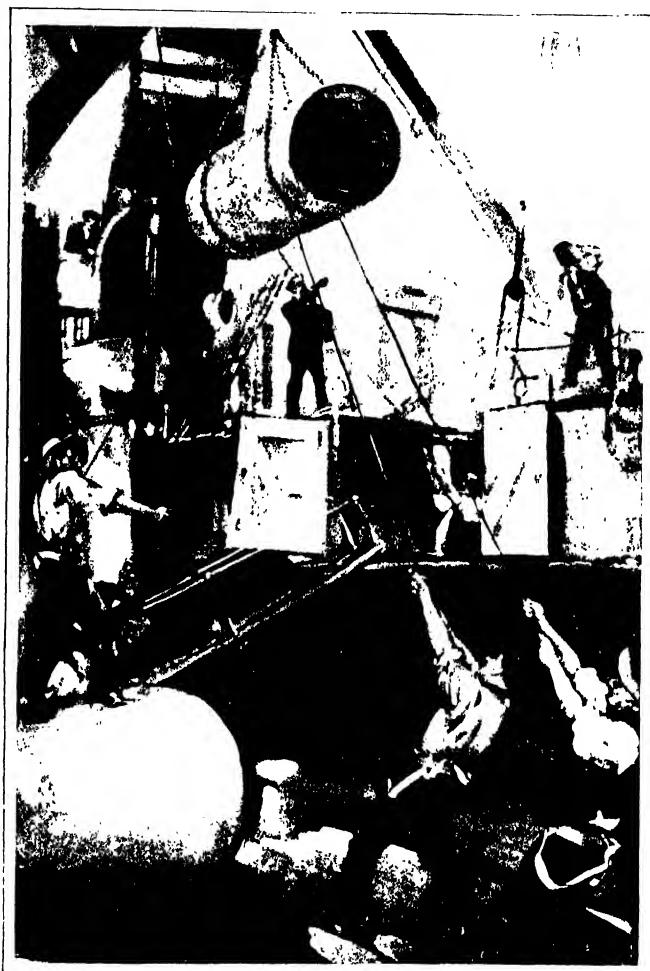
like madmen, roll, heave or carry them away to the far corners of the holds, and there neatly pile them in their appointed places—casks and heavy cases at the bottom, bales and light goods on top, so that there shall be no untoward smashing done. Everything is done according to well-ordered rules ; apparently aimless though this stowing may appear

to the layman, it is really directed by cunning laws. So many casks may be stowed in tiers, but no more, for fear lest the weight of the upper tiers should bilge the lower. Wet goods, such as casks of soda, hogsheads of wine, or barrels of treacle, may not be stowed on top of dry goods, lest there should be leakages and the cargo beneath suffer irreparable damage. And every individual cask must be stowed bung up and bilge free, to minimise the risks of leakage and crushing.

But there is still more system employed in the loading. If overmuch dead weight be carried in the bottom of the ship she becomes too stiff, and in a seaway will roll abominably. This rolling might prejudice not only the cargo's safety but the very safety of the ship, and so a certain proportion of dead weight is stowed into the 'ween decks to equalise matters somewhat.

During the time of loading her crew is probably not aboard; they were paid off when the ship was moored on the homeward journey. Two or three shore hands are employed, however, in touching up rusty places with paint; such places, that is, as cannot be reached at sea. Always there is an officer aboard to superintend matters, and this officer is the court of appeal in the stowage. He knows exactly the conditions ruling at the port where the cargo will be discharged, and therefore knows exactly how things should be stowed for handiness.

It may be that at one dock abroad machinery and wine will be disembarked; well, he must have the machinery and wine stowed so that they can be got at simultaneously, and not have them



The shipping of boilers is an awkward business. Special tackle is rigged capable of bearing almost any strain, and the cumbersome cylinders are slowly lowered to their resting-place.

covered up with stuff that has to be discharged at another dock, which would necessitate extra work for the foreign stevedores in removing the hampering cargo.

Before each hold is dunnaged the carpenter comes along and makes a careful inspection of the limbers to see that there

is no refuse to hamper the clear working of the pumps. He opens the limber-covers and cleans out all accumulations of rust and filth, and reports to the officer in charge what he has done ; whereupon the officer satisfies himself by a personal inspection that everything is in order, and gives orders to close down the limbers.

In the engine-room there is much work being done. Cylinder covers have been lifted by the shore staff, and accomplished mechanics are repairing ravages carefully, for this is an opportunity not to be missed, now that there is no likelihood of the engines being called upon for work. The thrust-blocks are all adrift ; the connecting-rods are being examined for signs of strain ; boilers are being sealed inside, for the various salts in the water have corroded them unmercifully ; fire-boxes are being cleaned, and boiler-tubes drawn and examined for flaws. Everywhere is bustle and orderly confusion.

In the cabins the stewards are busy receiving and stowing stores. These come down towards the last : casks of salt beef and pork, cases of cabin delicacies, sacks of peas, beans and rice, barrels of flour— their name is legion. Everything must be received by the chief steward, who carefully tallies off every item ere signing a receipt for the same ; and under his supervision the stores are stowed in store-room and lazarette, cabin fittings are received and placed in their appointed places, the medicine chest is refilled— supposing the ship carries no surgeon—and if time permits the cabins and saloons are

given a coat of paint.

Tallying the Ship's Stores

Meanwhile the
boatswain is receiv-
ing his stores : ropes,

oakum for caulking the decks, paint by the drum, brushes, holystones and deck-brooms. There are innumerable casks of oil coming aboard—all these have to be emptied into their appointed tanks and the empties returned ashore ; paints are stowed in lockers ; ropes must be sent down the forepeak out

of harm's way ; canvas is given in charge of one of the officers, perhaps, but the rope is the boatswain's special care—for a steamer, paradoxical as it may seem, uses up more rope in a year than a sailing vessel—not in rigging, but as cargo gear only. Therefore the rope is a very necessary thing.

During this rush of work the captain is probably away on holiday, but when he returns, as the spacious holds fill up, he has

The Captain's Busy Time

any amount of work to perform. He must see his owners and find out from them any information they may wish to transmit ; may receive cautions concerning certain parcels of cargo ; must listen to all complaints received from consignees and shippers. Later he must attend at the shipping office to sign on the crew, who have been chosen by the first mate. Here the captain signs his name on the articles and personally supervises the binding down of his men, signs all advance notes, and takes the men's discharge books into his personal keeping. He further visits the custom-house and receives whatever documents are necessary—declarations as to the amount of spirit he is carrying and the like. Also, he must appear at the port-captain's offices to obtain his latest information regarding the alteration of lights, etc., and either pay his dock-dues, light-dues and pilotage charges himself, or sign vouchers for his owners to do so. Once the ship is drawing near her sailing time the captain is a very busy man, for he has a hundred and one things to do. He has to obtain his bills of health for all the ports he is likely to call at, and to see that they are in order ; and he has to enter the approximate time of his ship's sailing in the dock-books so that the harbour master can arrange for the dock attendants to be in readiness and the gates opened, as also he arranges for a pilot to be aboard at the requisite time.

Down aboard the ship the last slings of cargo are going aboard—the perishable

freight and dangerous deck cargoes. Whisky and spirits of all kinds are being received; and one of the officers is in constant attendance to guard against any possibility of broaching. He tallies every case aboard, sees it stowed away in a special room, and when all is on board turns the key on the tempting stuff and gives his receipt.

The second officer is attending to the steering gear with the carpenter, making quite sure that nothing is wrong with it, for in close manœuvring a steamer depends entirely on her helm, and if anything should have been overlooked much damage might ensue. Also the second officer must see that the telegraphs are working correctly; he must receive the chronometers from the instrument maker, who has had them in his shop to regulate ever since the vessel arrived; must see that the compasses have no pieces of steel near them that might alter their reliability, and, in short, must do everything that appears to him necessary.

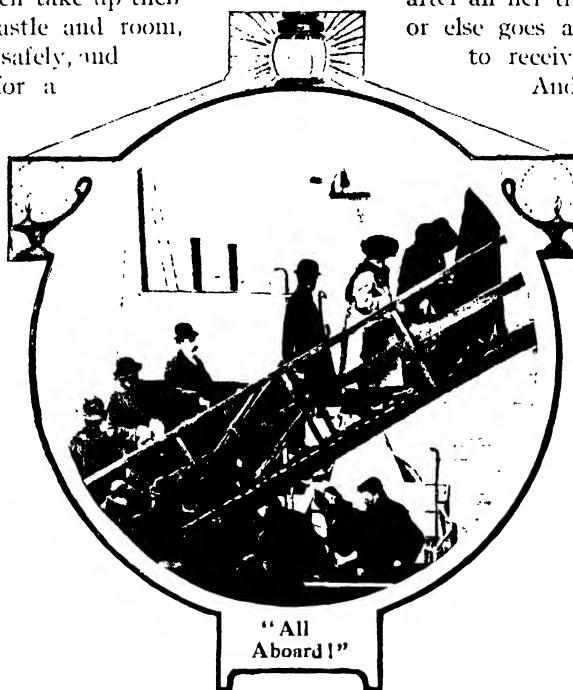
The crew comes aboard at midnight, perhaps. The men take up their residence in fo'castle and room, bestow their kits safely, and either turn in for a sleep before sailing, or else once more slip ashore for a last parting with their friends. In all likelihood the entire night is

devoted to receiving fresh batches of cargo that have been overlooked or rushed down in haste when it has transpired that there is a little more room, but morning comes at last. Then "Blue Peter" is run up to the fore, the surveyor comes aboard to see that everything is right, the captain receives last reports from all his subordinates, the engineers rush their firemen to get a full head of steam on the boilers, where the donkeyman has kindled the fires the night before. Presently the tugs arrive, the mooring lines are hauled in, the telegraph rings warningly, the whistle blows, the pilot ascends to the bridge, the mate goes forward to stand by his anchors, the second mate goes aft to see that no ropes foul the propeller, the screw tears the stagnant water of the dock into foam, the gates open, lines are passed ashore—hove tight to keep the vessel from damaging herself against the piers—the tugs twitch this way and that until the steamer gains the open river. The whistle blows again, and she either makes straight for open water, where she can behave like a living, sentient thing

after all her time of helplessness, or else goes alongside the stage to receive her passengers.

And when once her stern is turned to the shore "Blue Peter" drops from the masthead, and the ship is off on yet another voyage.

F. H. SHAW.



The “Victory” and Trafalgar

SHES lies off the Gun Wharf in Portsmouth Harbour. At the first glance one misses the immense masts, heavy shrouds and rigging, stout cables and triple battery of formidable guns, that in the old days made her a vision of solid and towering menace from water-line to mast-head. The monkey-spars she now carries—they were taken out of the old *Shah* to put into her—are trivial, almost ludicrous. The hull is the hull of Nelson's *Victory*, unaltered (save that the modern hand has cut scuttles in the sides for ventilating the cockpit), and, to all appearance, wonderfully preserved. Appearances in this case are somewhat deceptive: for we hear that she has continually to be patched and painted and doctored in one way and another. Still, the *Victory*—the hull of her is very nearly the same ship in which Hood and Jervis and Nelson hoisted their flags.

She was launched in 1755, and was one of the largest ships of her day and generation. She was 2,164 tons burden, was rated for 100 guns (she really carried 102), and had a complement of 841 men. She was classed first-rate with such ships

The Greatness that is Gone

both of 100 guns, or two only in excess of the famous “fighting *Téméraire*”—made still more famous by Turner's great picture.

But it is of Nelson and Trafalgar that one must write when the *Victory* is under consideration. There can be no time wasted on that grand ship's more petty achievements, no space given to that

wearied two-years' chase the world over in search of the French and Spanish fleets, which were eventually found off Finisterre after Nelson had given up hope of battle and had gone home. Hastily Nelson re-victualled his ship and sailed on September 15th, 1805, from Portsmouth, the eyes of the nation upon him, their cheers ringing in his ears. The great

admiral took over command of the fleet from Lord Collingwood on September 29th his birthday—and came in sight of the enemy at daybreak on October 21st. The enemy numbered thirty-three sail of the line and seven large frigates, forming a long crescent in close line of battle ahead on the starboard tack off Cape Trafalgar, close to the southernmost point of Andalusia. Our fleet consisted of twenty-seven sail of the line and four frigates. Their superiority was even greater in size and weight of metal than in numbers, and they had four thousand troops dispersed about the fleet.

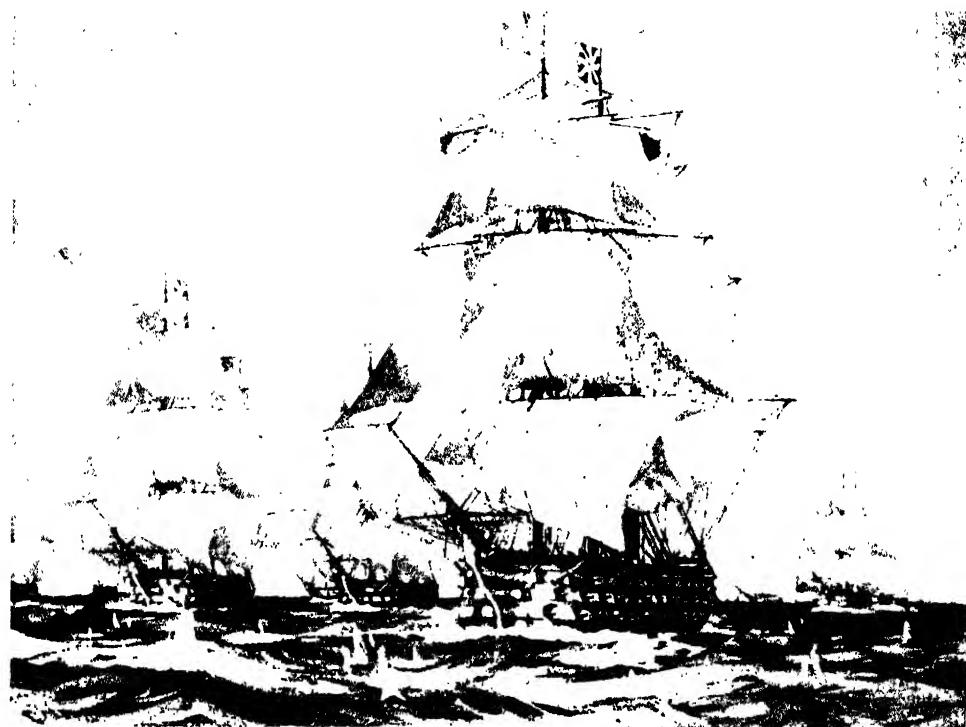
Soon after daylight Nelson came on deck. He wore his “fighting-coat”—a threadbare frock uniform-coat, with four weather-tarnished and lustreless stars sewn on the left breast.

At about half-past six he took down the glass from his eye and called to his signal-officer to make the signal to bear down on the enemy in two lines; and the fleet set all sail. Collingwood, in the *Royal Sovereign*, led the lee line of thirteen ships; the *Victory* led the weather-line of fourteen.

The crews had finished their dinner, and were now hanging about and gossiping by their guns, or getting ready their fire-buckets, rammers, and cartridges. The shot was piled, the powder passed

In Sight of the Enemy





As the *Victory* slowly advanced the enemy opened upon her such a fire as has seldom been directed upon a single ship.

up from the magazines. The battle-field was spread a plain of dark blue with a long heavy swell rolling up from westward, and the noonday sun shining on the fresh painted sides of the enemy. Before the swell the British ships moved majestically, with light winds from the south west. The British admirals hoisted their own flags, and the others the white or St. George's ensign. Besides this, each British ship carried a Union Jack at her main-top-mast-stay, and another at her fore topgallant-stay. At the *Victory*'s main-topgallant-mast-head, also Nelson had fast belayed his pet signal—No. 16, "Engage the enemy more closely."

Everything seemed in order, but Nelson remarked that he must give the fleet something by way of a fillip. Accordingly, at about ten minutes before noon, up went to the *Victory*'s mizzen-topgallant-mast-head the first part of the

famous message—Nelson's last signal—"ENGLAND EXPECTS EVERY MAN TO DO HIS DUTY."

As soon as this signal was read by the other ships there ran through the British fleet a thrill, electric and unanimous. Out broke a cheer and ran from deck to deck, gathering volume as it rolled. The signal spoke like a voice from home, and the shout that answered it promised victory. "Now," said Nelson, "I can do no more. We must trust to the Great Disposer of all events and the justice of our cause."

The weather column was steered two points further north than Collingwood's, in order to cut off the enemy's escape into Cadiz which they were obviously trying to keep open for escape, if necessary—the lee-line, therefore, was first engaged. At about ten minutes past noon the *Royal Sovereign*, steered as straight and

The Sea and its Story

steadily as if she were going into Portsmouth Harbour, drove into the centre of the crescent.

" See ! " cried Nelson, " see how that noble fellow Collingwood takes his ship into action."

Meanwhile, the *Victory* held on her way with the weather-line. She flew half a

**The Victory
Moves into
Action**

dozen flags aloft, for fear that one might be shot away ; but

although every glass on

board was used no one could discover the flag of the French commander-in-chief, whose ship Nelson desired to grapple with. As the *Victory* slowly advanced seeking her antagonist, the enemy's ships ahead began measuring distances with her by firing single shot, until they saw a shot pass through the main-topgallant sail. A minute or two of dead silence followed ; and then, as if by concerted signal, the whole van, or at least seven or eight of the weathermost ships, opened upon the *Victory* such a fire as has seldom been directed upon a single ship. They fired high, aiming chiefly at her rigging, in the hope to disable her before she could close with them

W. E. 7

Still the *Victory* moved down, silent and intent, firing no shot until twenty of her men were killed, thirty wounded, her mizzen-top-mast and every studding-sail boom on the fore-mast shot away, and every sail in tatters. The Admiral's secretary, Mr. Scott, was one of the first to fall. He was talking with Hardy on the quarterdeck when a round shot came and cut him in half. Captain Adair, of the Marines, with the help of a sailor, tried to remove the body, but the Admiral had noticed it.

" Is that poor Scott that's gone ? " he asked.

Just after a double-headed shot tore across the poop and killed eight marines ; whereupon Nelson desired Captain Adair to disperse his men about the ship, that they might not suffer so much from being together. A minute or two later a shot struck the fore-brace-bits on the quarter-

deck, sending the splinters right and left, and passed between Nelson and Hardy, a splinter tearing off Hardy's buckle and bruising his foot. They stopped and looked anxiously at each other, each supposing the other to be wounded. Nelson then smiled, and said : " This is too warm work, Hardy, to last long."

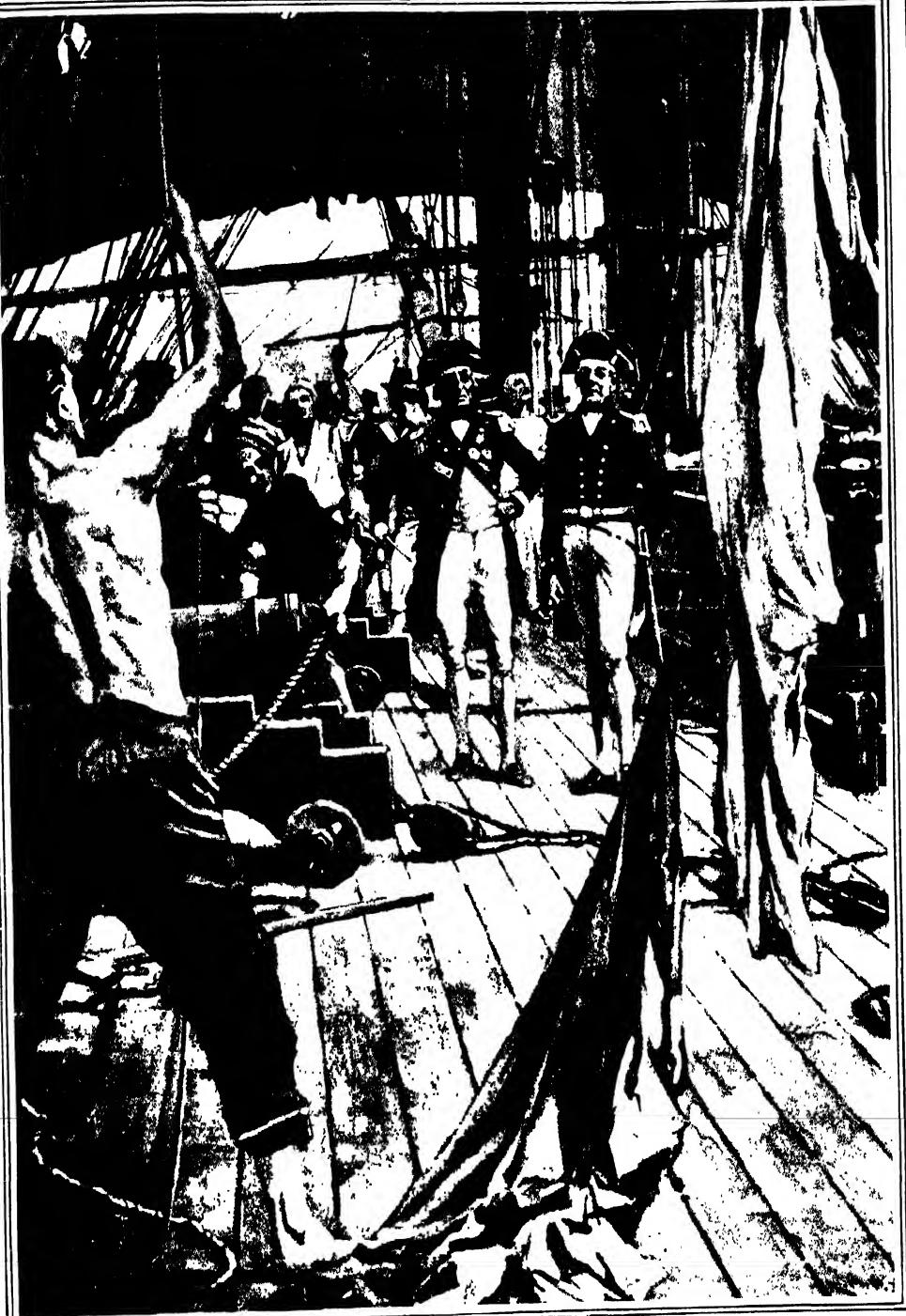
Having no means of distinguishing the French Admiral's ship, Nelson characteristically chose the largest of all, the great four-decker *Santisima Trinidad* (130 guns), his old acquaintance as he used to call her. She was the ninth ship in the van of the crescent ; and to her bows he ordered the *Victory* to be steered. The French and Spanish ships, however, seeing by her course that the *Victory* was about to follow the example of the *Royal Sovereign*, closed together like a forest. It was not possible to break the enemy's line without running on board one of their ships.

" Which will you run aboard ? " Hardy asked.

" Take your choice : it doesn't signify much." Hardy steered for the stern of the *Bucentaure*, passing her so closely that, had there been wind enough to blow it out, the *Victory*'s crew might have torn away the large French ensign trailing at her peak. Just exactly at one o'clock the first of the *Victory*'s guns - the 68-pounder carronade on the port side of her forecastle, holding its usual charge of one round shot and a keg filled with 500 musket-balls - was fired right into the cabin windows of the *Bucentaure* ; and, as the *Victory* slowly went past, every gun of the remaining fifty

A Terrible Cannonade

on her broadside, all double- and some of them treble-shotted, was fired deliberately into the helpless Frenchman. She, as it turned out, was the French Admiral's ship, and this one broadside as good as finished her. In two minutes, though not a mast or yard was seen to come down, she lost close on four hundred men, and had twenty of her guns dismounted : her



THE LAST MESSAGE

To the *Victory's* mizzen-topgallant-mast-head up went the first part of the famous message, "England expects every man to do his duty!"

fate was sealed, and she did little more before surrendering to the *Conqueror* at about two in the afternoon.

As the *Victory* passed clear of her, receiving in her turn a clever fire from the French *Neptune*, Hardy ordered the master to put the helm hard-a-port, and ran on board the *Redoutable*, just as her tiller

**Nelson
Disdained
Musketry**

ropes were shot away. The French ship received her with a broadside, then instantly let down her lower deck ports, for fear of being boarded through them, and never fired another great gun from them during the action. Her tops were filled with riflemen. Nelson would never place musketry in his tops; he held that it not only risked setting fire to the sails, but was a petty form of warfare that killed men without ever deciding the fate of a battle.

These two ships dropped alongside of each other about ten minutes past one. The *Redoutable* fired her main-deck guns and kept up a storm of musketry. The *Victory* replied by firing her starboard 68-pounder carronades right upon the *Redoutable*'s decks, and making play also from her middle and lower decks. She kept up a fairly effective fire, too, upon the *Bucentaure* and the *Santissima Trinidad*, the two ships drifting away from her on her larboard hand. Twice, as the *Redoutable*'s guns became silent, Nelson, supposing she had struck (for she carried no flag), gave the order to cease firing, and turned his attention to the larboard guns, hoping to give the *Bucentaure* her *coup de grace*; but at once the firing from the *Redoutable*'s tops grew brisker. It descended like hail whenever the smoke lifted a little from the *Victory*'s deck, revealing the epaulets of our officers; and there was a fellow kneeling in the mizzen-top, in glazed hat and white jacket, who had a bullet in his pouch that was to do more damage than all the ships of France and Spain.

Nelson, while the *Victory* had been fitting to receive his flag, had ordered

a large skylight over his cabin to be removed, and the space planked up, so as to afford him a walk amidships of about twenty-one feet, clear of the guns and ropes. It was about twenty-five minutes past one, and Nelson and Hardy were pacing here together, to and fro. The two had arrived within one pace of the regular turning-spot at the cabin ladder-way, when Nelson (who, regardless of quarterdeck etiquette, was walking on the larboard side) suddenly faced left about. Hardy turned almost at the same instant, and saw him in the act of falling. A musket-ball had struck him on the left shoulder, by the edge of the epaulet, cut through the spine, and buried itself in the muscles of the back towards the right side. He dropped at once upon his side, on the spot yet red with the blood of poor Scott.

Seeker, a sergeant of Marines, and two privates, ran forward to pick him up.

"They have done it at last, Hardy," said Nelson, as he was lifted.

"I hope not."

"Yes; my backbone is shot through."

Yet even now he had presence of mind, as they were carrying him down to the cockpit, to observe that the tiller-ropes, which had been shot away, were not yet replaced, and to order that new ones should be rove immediately.

Down in the cockpit of the *Victory* the surgeon soon perceived that Nelson's wound was mortal. Nelson himself was certain of this from the first, and insisted that Surgeon Beatty should go and attend to others; "for," said he, "you can do nothing for me." His sufferings from pain and thirst were very great, and all that could be done

**The Dying
Admiral**

was to fan him with paper and give him lemonade from time to time. He kept asking for Hardy, that he might know how the fight went; but Hardy could not leave the deck at this most critical stage of the fight, and it was more than an hour before he thought it right to go below. Nelson began to

think he must be dead, and repeatedly cried, "Will no one bring Hardy to me? He must be killed! he is surely dead!"

And now even to those in the cockpit the result of the action began to declare itself. As often as a ship struck the crew



Last of all he begged Hardy to kiss him. Hardy knelt down and kissed his cheek and forehead.

Hardy's aide-de-camp, Mr. Bulkly, came down to the cockpit and told the surgeon the reasons that detained the captain, but promised that he would take the first opportunity to leave the deck.

of the *Victory* sent up a cheer, and at every hurrah a gleam of joy passed over the face of the dying Admiral. When, at length, Hardy came down and took his hand in silence, Nelson's

first question was, "How goes' the day with us?"

"Very well, my lord. We have taken ten ships; but five of their van have tacked and mean to bear down on us; but I have called two or three of our fresh ships round, and have no doubt of giving them a drubbing."

"None of ours have struck, I hope?"

"There is no fear of that."

"I am a dead man, Hardy; I am going fast; it will be all over with me soon."

Hardy tore himself away and ran up on deck, unable any longer to hold back his tears. Soon after the *Victory* opened her larboard guns upon the enemy's squadron passing to windward. The concussion of the firing shook the cockpit. "Oh, *Victory, Victory!* how you distract my poor brain," cried Nelson. After a short pause he added, "How dear is life to all men!" By this time all feeling below the breast was gone.

In another fifty minutes Hardy came down to the cockpit again, and, again taking the hand of his dying friend and commander, congratulated him on a complete victory. How many of the enemy were taken he did not know, as it was impossible to see them distinctly through the smoke, but fourteen or fifteen at least.

"That's well," cried Nelson; "but I bargained for twenty." Then, in a stronger voice, "Anchor, Hardy - anchor!"

"I have sent Lieutenant Hill to Lord Collingwood, who, I suppose, will now take upon himself the direction of affairs."

The Last Few Moments "Not whilst I live, Hardy no other man shall command whilst

I live!" He tried to raise himself up from his pallet. "Anchor, Hardy, anchor!"

Hardy was returning to deck when Nelson called him back and begged him to bend close. He then delivered his last injunctions that his hair might be cut off and given to Lady Hamilton,

and that his body might not be thrown overboard, but taken home to England and buried beside his parents, unless the king should order otherwise.

"Take care of my dear Lady Hamilton; take care of poor Lady Hamilton!"

Last of all he begged Hardy to kiss him.

"Kiss me, Hardy," said he. Hardy knelt down and kissed his cheek and forehead.

"Who is that?"

"It is Hardy, my lord. It is Hardy."

"God bless you, Hardy."

Hardy now left him for the last time. Nelson was turned on his right side, and death was now rapidly approaching. He muttered some inarticulate sentences, ending, "Remember that I leave Lady Hamilton and my daughter Horatia as a legacy to my country."

Then once or twice he was heard to murmur to himself, "I have done my duty; I praise God for it." These were his last words.

At half-past four, three hours and a quarter after he had received his wound, Nelson of the Nile was dead.

The fight was over before this indeed, but a minute or so before, the last guns fired after the beaten enemy were heard in the cockpit.

Just as the battle ended, Cape Trafalgar was seen from the *Royal Sovereign*, bearing S.E. by E., distant eight miles. Hence the name given to this battle, the immediate result of which was seventeen French and Spanish ships captured and one French ship burnt. The total British loss amounted to 1,587. So perfectly had Nelson performed his work, that (to use Southey's words) "the fleets of the enemy were not merely defeated but destroyed. New navies must be built, and a new race of seamen reared for them before the possibility of invading our shores could again be contemplated." In truth, it marked the real turning-point of Napoleon's fate, even though his most splendid victories came later. Trafalgar once fought, Waterloo became but a question of time.

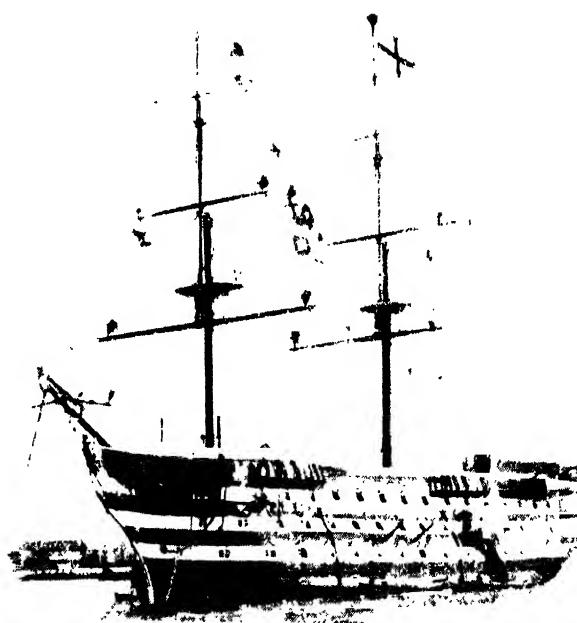
The Death of Nelson

Nelson's body was taken home. Collingwood wished to send it in the *Euryalus*, but the men of the *Victory* begged so hard for the honour that he gave way. The *Victory* sailed from Gibraltar on the 7th of November, and after a rough and tedious passage reached Portsmouth on December the 2nd.

On the 10th of December the *Victory* again sailed from Portsmouth, and on the 22nd, when crossing from Margate, was hailed by the yacht which the Admiralty had despatched for the body. The body was placed in the famous coffin

which Captain Hallowell had made from the timbers of the *Orient* in 1799. The coffin was lowered into the yacht, and the *Victory* struck, for the last time, Lord Nelson's flag at the fore. He lies now in the vault of St. Paul's, whither he was borne with all the vain pomp that the nation could lavish upon him; and as the coffin was lowered the sailors took the flag that covered it and tore it into strips, to keep till their death and leave to their children as a memento of their darling leader.

So ends the story of Nelson, Trafalgar, and the *Victory*.



H.M.S. *Victory* at Portsmouth on the anniversary of Nelson's death decorated with laurels, and flying the famous signal that she flew at Trafalgar.

The Merchant Sailor

B

"UT," says your seafaring pessimist, usually an old skipper, "the British merchant seaman no longer exists. He has degenerated into a sort of compromise between a painter and a collier; he is hardly able to tie a bowline, he couldn't splice a brace if you gave him twenty pounds a month for it, and as for knowing anything about sailing ships, well, he doesn't." And therein our critic makes one of many mistakes; he does not allow for the change of circumstance, than which there is no greater modeller known. For, after all, what good would a man be aboard a modern steamer who knew all there was to know about knots and splices, and more than all the average human being knows about a sailing ship? He would be out of his element, amazed amidst a network of appalling marvels; aghast at the unfamiliar scene. He would be so flustered at hearing voices speaking to him apparently from nowhere, at seeing ropes hove in without a single hand to aid, that he would consider he was the victim of some first-night-ashore dream, and would promptly determine to sign the pledge.

The Sailor has Changed

handy with paint-brush, who can shovel coal with the best collier, who can in general act the part of a long-shore handyman—why, the Britisher has adapted himself to the change, in a great measure.

Not altogether, not even nearly altogether. For you cannot judge a class

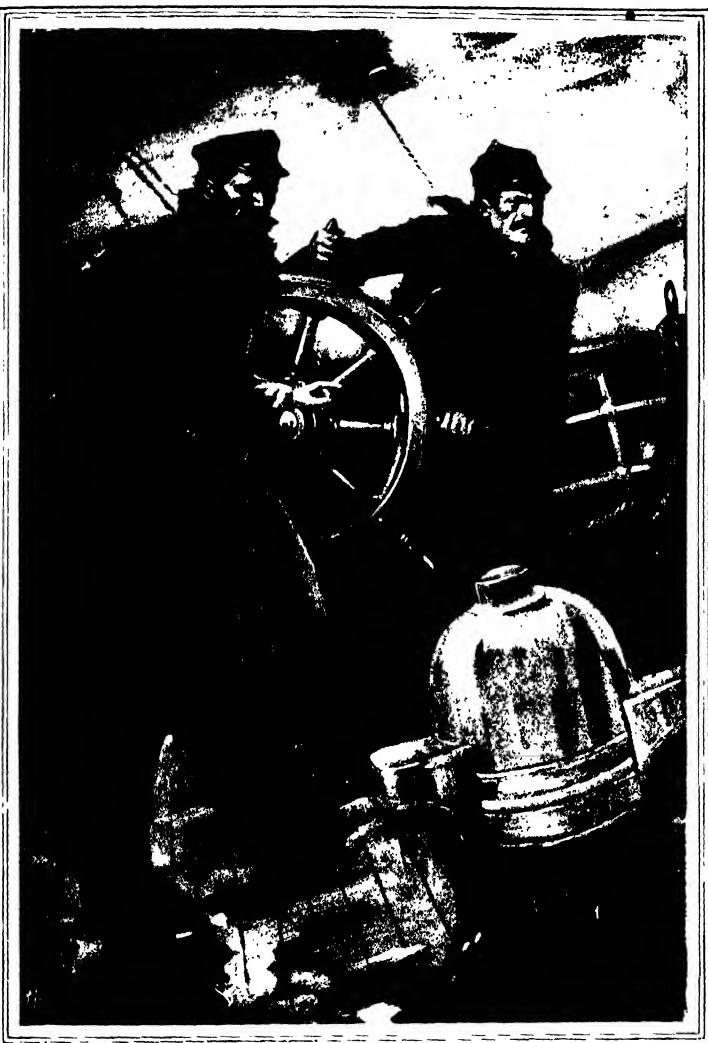
by an example when studying humanity

every unit is a problem to himself. Here and there, in out-of-the-way corners of the seven seas, far removed perhaps from the well-recognised "lanes," in those roaring solitudes where liners seldom penetrate for fear of giving their passengers bad hours, you still may happen across the

Merchant Jack To-day

merchant sailor as he was, and I grant you that he will prove an interesting study.

Merchant Jack of to-day is far from being a picturesque figure. He wears no natty uniform in the first place; and an adage has it that "clothes make the man." Therefore Jack must be a most disreputable amphibian, for when he is engaged on his chosen work he presents an appearance that would shock the average patron of the casual ward. But then Jack knows that sailing ship work cannot be carried on in blue serge and white braid—at least, if the serge and white braid are not to suffer cruelly. Therefore he sacrifices picturesqueness to utility, and the result is an unpleasing effect. But if you happen to be one of those who pass the dress and consider the face above the dress and the body within it—ah, there you find out the real man! And you will see much in him to like, some little to fear, a trifle to detest, and everything to admire. For Merchant Jack, despite his many decriers, is a very noble being, if for no other reason, in that he daily casts a gallant gauntlet into the very face of death, and works calmly amongst such upheavals of storm as would appal any man who was not a merchant seaman. Ay, and Merchant Jack can give points to his more disciplined brother



For a night and a day he gripped the wheel, steering the ship through the most awful storm he had ever seen.

of the Royal Navy in some respects. Navy Jack knows but little of facing death in tiny, undermanned vessels, vessels which are meant to sink when they are despatched from port. Navy Jack may be a specialist in gunnery, may have the bull-dog courage which helped Nelson to carry his flag to victory; but he has something else: a fatherly governmental care. He is a useful member of society, and as such is to be fed and cherished. Merchant Jack, on the other hand, is an Ishmael—Government treats him to all

intents and purposes as a negligible quantity. To be sure it allots him a scale of provisions, so cunningly calculated that it enables him to live without actual hunger, but so cunningly interpreted that it often leaves him on the narrow verge of malnutrition and sheer starvation.

So, taking into consideration the fact that Merchant Jack is held to be every man's enemy, from the shipowner, down by way of captain and officer even to himself, it may be taken as read that he is superior in most things to his naval brother; for courage that is bred of discipline and careful training is inferior to the courage that is bred of hardship and, oftentimes, distress. And it may be accounted to Jack forrighteousness that

he very seldom turns his back on a fellow-seaman in distress, seldom sees one perish without making some extremely gallant effort to save him, and, when he has saved him, is ready to share the very shirt off his poorly clad back in order that his salvage might taste comfort once more. None of which small facts ever creep into the papers, so that no one can accuse the subject of this article of a desire for self-advertisement. In fact, Jack would hardly know what self-advertisement meant.

But the term Merchant Sailor is more embracing than merely to include the fo'castle hands. I take it that every member of the Mercantile Marine comes into the scale in one way or another, and therefore it may be advisable to take a short glimpse at the various members of various grades, ere passing to the sub-

ject of Fo'castle Jack himself.

The Power of the Captain

Naturally enough the captain takes pride of

place. He is the brain of the ship, its autocrat, holding the high, middle and low justices in his hand. He is the embodiment of seafaring law, and from his verdict there is no appeal—at sea, that is. Ashore Fo'castle Jack might seek redress from too much tyranny at the hands of the British Consul; but whilst on deep water there is none to contradict the ruling of the captain. It is no wonder that the merchant service became at one time a veritable hell of tyranny and wrongdoing. A ship was apt to be absent from land for a period of four months or more, and during that time there was no possibility of outside intervention. This was an opportunity not to be lost by sundry cold-blooded scoundrels who disgraced the service to which they belonged. Hence the hell-ships of the middle nineteenth century, when men were positively tortured at the will of their oppressors. There was no fear of vengeance smiting the perpetrators; they were too cunning for that. Let the ship arrive in port with her men bursting under a sense of their wrongs—a word to a crimp and the thing was done, even before the vessel had come to her anchors. The discontented—and rightly discontented—sailors were attended to summarily. False friends appeared on board, men who offered fair promises and many drinks. Poor Jack! He drank and believed, and he wakened from his drugged sleep to find himself aboard an outward-bound ship, minus pay, minus clothes, minus most things.

• But, nowadays, these hell-ships are

practically extinct. To be sure, you may find them here and there, and even under the Red Ensign, but they are few and far between. Ports are too close together; Merchant Jack is too much of a man to stand such treatment.

Also, and this is a factor which must certainly be taken into account, captains and officers are different men. They are educated to a certain extent, whatever their men may be, and education invariably results in a hatred of cruelty. So the only actual cruelty to which Jack is subjected at the hands of his superiors is the cruelty of unnecessary work and insufficient feeding.

Various types of sea-captains occur to memory, even as various types of fo'castle hands come to the mental screen. I have sailed with many masters; all were types. One captain I remember was an exception to the general run of the class. He was a blend of Irishman and Nova Scotian, combining the worst qualities of both nationalities. He was never happy unless he had his men working hard, no matter what the weather conditions might be. Also, he was a sneak and a spy; he had a habit of slinking about the decks after nightfall in felt-soled shoes, and aided by these auxiliaries he would listen under open ports to the general conversation of fo'castle and half-deck. Woe betide the man or boy who spoke with an unbridled tongue! All unblushingly—for shame was a thing unknown to him—this captain would accuse the speaker of his words, and would visit him with explosive wrath.

Regarding another trait. He seemed to have a rooted objection to feeding his men

Saving Ha'pence on the Food

decently. He scraped off every pound of meat from the lawful rations whenever it could be done; and had no compunction in serving out rotten meat. I remember that once a large piece of salt-horse was turned up from the harness casks, and it was an offence to the pure sea air

“This meat isn't fit for the men,” said



WHEN COURAGE CONQUERS FEAR

"Women and children first!" is always the cry of the British merchant sailor
when fire or storm necessitate the leaving of the ship.

The Sea and its Story

the steward, and the captain sniffed it—from a safe distance. "Give it to the boys," he said. The boys were the apprentices—sons of gentlemen for the most part!

He had all the inclination to be a bully, this captain, but he had not the necessary pluck. Anyone who stood up boldly against

The Reward of Fool- hardiness

him could generally carry his point at the moment, though

the momentary victor

was usually victimised in some under-handed way at a later date. And it was in stormy weather that this captain showed himself in his true colours. He wanted to be a "cracker-on" as the phrase goes; that is, he wanted to have a reputation for daring and skill in making quick passages. To give him confidence to carry sail he would imbibe large quantities of the worst whisky; and, primed well thus, would pile canvas on canvas until the ship seemed ready to lose her masts. Then, when the wind was increasing forcefully, when the decks were awash—and it was a matter of extreme danger to move from point to point—the whisky would evaporate, cold fear would come to take the place of the Dutch courage, and the order would go forth to shorten sail. In the midst of the ensuing chaos of ruined sails and livid danger, our captain would be crouched on his knees in the chart-room muttering maudlin prayers! This is one type of merchant skipper: fortunately he is rare.

By way of contrast, look at another of my superiors. He was a man of capital education, with a leaning towards the higher Greek classics. He spoke seven foreign languages perfectly, and being in possession of private means there was no actual need for him to use the sea at all. But he loved it; he was never happy save when out of sight of land. I have seen that man face the biggest gale of wind conceivable without a tremor, and sing gaily as a raving Atlantic cyclone reached its height. I have seen him chanting Homeric thunder in an attempt

to outvie the thunder of the storm; and the higher the gale rose the higher his courage soared. No danger was too great to dwarf his courage; no discomfort too bitter to affect his magnificent spirit. I did not see him at his best: that was reserved for others. It happened not very long ago; a ship appealed to him for help. An ordinary man would have been well content to bring his own ship through the boiling horror of that storm in safety, without bestowing a second thought on a perishing fabric, but not so Captain A—. To hear was to answer. For one tremendous night he stood by in readiness, waiting for a smooth, hoping, praying, and the smooth he sought was granted. He would not send his officers away in charge of a boat—he feared for their lives; but he went himself. He was guilty of a mistake according to sea-law—no master is supposed to leave his ship in any position of danger but the glorious humanity of the man refused to be trammelled by convention. He took a ship's lifeboat through a sea that would have startled a Viking; and he brought the distressed crew back in safety himself and four loyal men, who would have gone to the gates of the Pit at his bidding.

Every man aboard his ship was a friend—not an enemy to be crushed and bullied to the verge of lunacy. Not a complaint too insignificant to receive his personal attention; not a wrong but that he could find some redress. He rose to a superlative height on one occasion when the plague of yellow fever ran like wildfire amongst his crew. Quick to act, quicker to bear the

**A Salt-sea
Hero**
onus, he isolated every sufferer carefully in one apartment; he gave the ship over to the charge of the chief officer, and lived in that plague-infected room for three solid weeks, never venturing near a healthy human being lest he should convey the contagion to them. Men died in that horrid room; he laid them out and personally committed their

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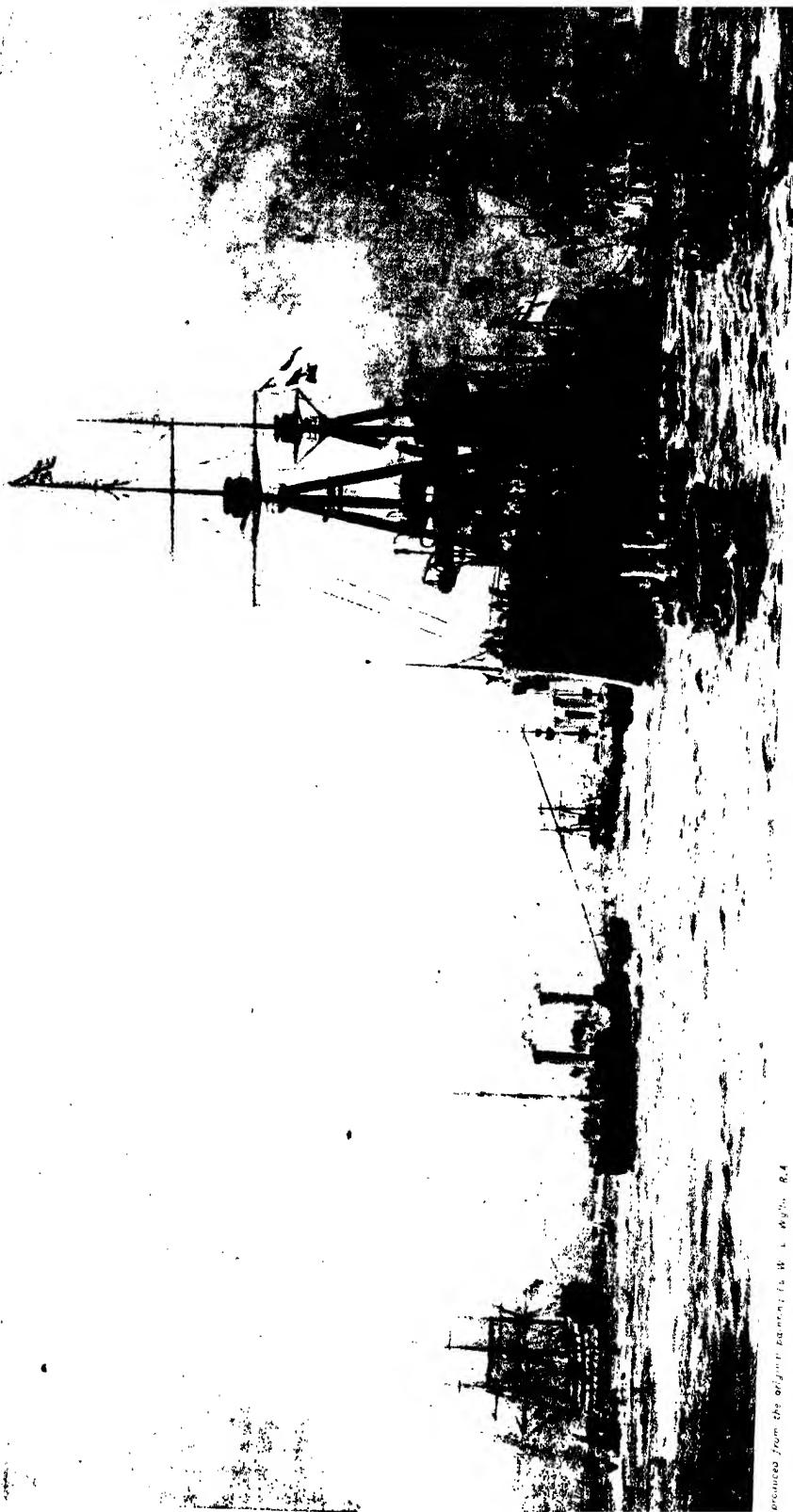
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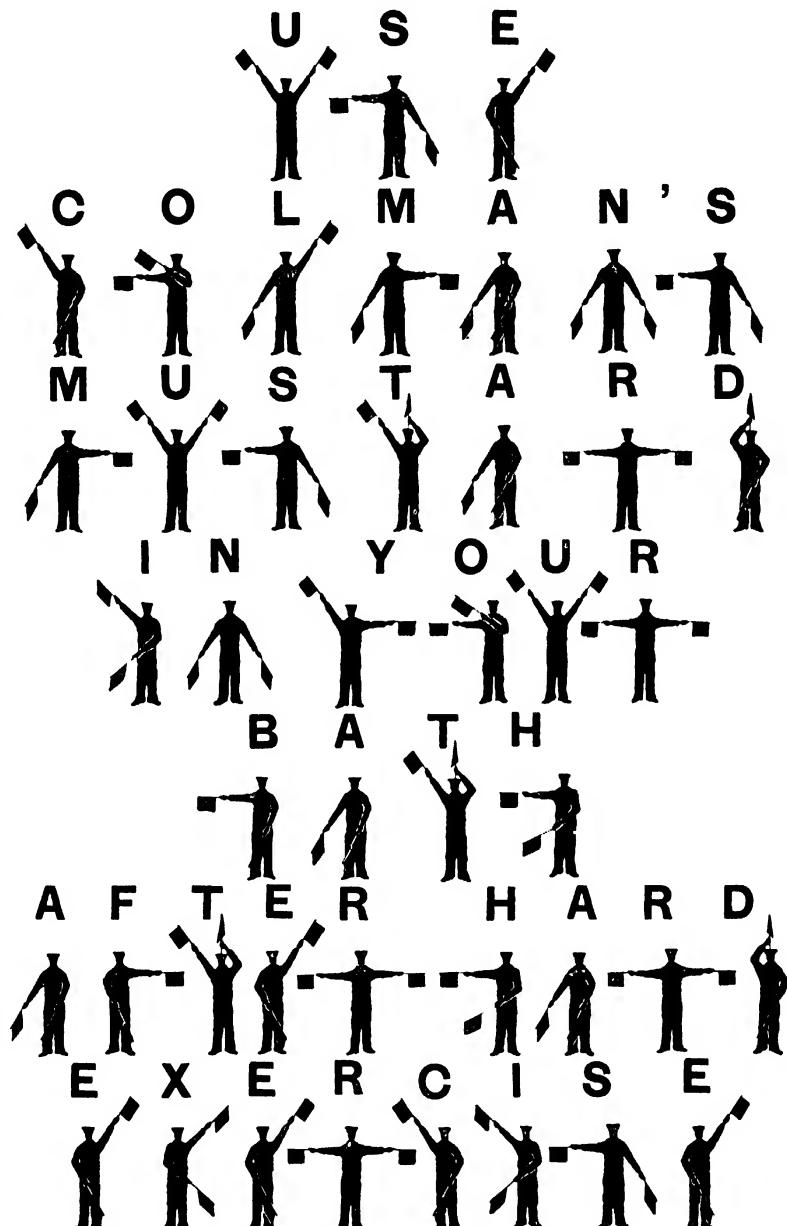
THE SEA AND ITS STORY



EDITED BY
CAPT FRANK H. SHAW
AND ERNEST H. ROBINSON

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A MESSAGE FROM THE NAVY



TO BRITISH PEOPLE!



WHEN BLAKE WHIPPED THE SEAS.

A fight between Blake and Van Tromp,
Admiral of Holland.

From a painting by Charles Dixon, R.A.

bodies to the deep. He sat for night after awful night ministering to the needs of the poor sufferers, sacrificing himself at every turn. And when the work was done he smiled into the faces of those who would have spoken against this unusual construing of a captain's duty, and said : "They're my men, and I feel responsible for them." That is another type of a merchant captain ; and his type is commoner than the first mentioned.

The liner captain is, apparently, a mere figurehead, set there to chat entertainingly to bored passengers, or to play with the children. Sea transit is usually so safe that the average traveller forgets the real purpose of the bearded man with the genial face and the memory of a Datas, who can call to mind every face he sees, and remember the voyage on which that face's owner travelled, as well as if he had crossed only a month before. Your modern captain is a man of infinite tact ; with the welfare of the line he serves his paramount ambition, ready to go to almost any lengths to maintain his ship's popularity, not that kudos may accrue to himself, but that the bookings at the head office may be augmented.

It is in moments of crisis that we see

the merchant captain as he is. A high steel prow has raced out of a blinding fog-bank and the liner is cut down to the water's edge. There is a flurry toward ; two thousand passengers are fighting



Aloft in a howling hurricane, pounding the iron-hard sail with bruised and bleeding fingers, fighting desperately for every inch of canvas they drag to the yard.

desperately for safety, their manhood forgotten before a gust of terror. It is then the captain exerts his powers.

"Women and children first ; I'll shoot the man who rushes ! " And he will do it, too, as surely as his calm, strong voice beats down the unmanly turmoil of



The ship was only saved by the men venturing aloft, at imminent risk of their lives, after the captain had bidden them not to go.

sound. Calm and clear-headed, swift to discard and swift to retain—with his brain working as steadily as his own standard-compass—he takes such measures as are possible for the ship's salvation, and for the salvation of those on board; and on many an historic occasion has the coolness of the captain alone averted what might well have been a catastrophe of such hideousness as not to bear contemplation in cold blood.

That is your merchant skipper. He may have his weaknesses; he may on

occasion be too didactic, too peremptory, but at heart he is a gallant man, with some small culture of his own, with a ready wit, and a capacity for smoothing over petty troubles, yet with such a mighty reserve of courage and ability underlying his nonchalance as must make us who have seen him in emergency admire him even whilst not understanding.

And he has other enemies to contend with besides the sea. Suddenly, without warning, mutiny may flare up, and he has to withstand a mob of drunken dagos, or the frenzied rush of a crowd of maddened las-ears. Then is the time when brute force and calm-eyed courage must go hand-in-hand.

Your merchant officer is but a captain of a lesser

growth; he hopes to be, in time, a captain himself. You can see him in perfection aboard any liner—for his abilities can only find their proper scope in a vast modern ship. He is a skilled specialist, no less. He has had a scientific education that has not only taught him everything there is to know about a ship, from the keel to the truck, that has given him full knowledge of the workings of that elusive power we call magnetism; but has also taught him exactly why every storm arises, and where it is most to be

feared. He can find his way from land to land by a hundred different methods ; every single star is to him a friend and a guide ; he knows them well. He can reduce the most alarming atmospheric phenomena to a thoughtful system ; he has a reason for everything that happens. More often than not, in addition to being a fully qualified master in his own right, he is also a lieutenant in the naval reserve, having served for a year or more aboard a first-rate battleship as a full lieutenant in the navy. He is full to the chin of lore, and is as ready to explain the reason why a planet has such and such an orbit as he is to train and fire a twelve-inch gun.

In between whiles he cultivates the softer social graces, and manages to while away the tedium of a lengthy voyage for fair passengers by dint of his conversational powers and his acknowledged skill in dancing.

But there is a vast brotherhood of men which now claims our attention, so vast indeed that its types are innumerable. Fo'castle Jack is a curious creature ; and it is doubtful if any but a sailor will ever understand that quaint combination of childish soft-heartedness, stern self-reliance, dare-devil bravery and utter inconsequence that goes to make up the merchant seaman.

To see Jack at his best you should peep some day into the fo'castle of a deep-water sailing ship. Alas for mistaken legislation that allows such fo'castles to become the harbourage of the outcasts of every land under the

**A Word
of
Warning** sun, rather than the
sterling men of Britain ! It is getting almost
an unknown thing to

hear of a British ship sailing with an entirely British crew ; the majority of her hands are Dutchmen, Russians, Finns, Spaniards and Portuguese, even Swiss, though only heaven knows what a Swiss wants at sea ! Permit a word of warning on this great danger. Who is to blame ? is the first question

that arises to the lips. Is it the ship-owner ?

And then, why is there such a growing paucity of merchant sailors of British blood ? Simply because the cry of their native land is for cheapness ; cheapness in building ships, cheapness in running them, cheapness in handling them, above all, far overtowering all these things, because the British nation must have cheap food.

**Who
is to
Blame ?**

That is the keynote of the whole mischief. Shipowners must move with the times ; they must cut down their freights to the lowest, and to do so they must sail their ships with few men at miserable wages. The average Briton is an independent soul, he will not be driven unduly. There comes a time when he looks matters squarely in the face and begins to ask himself questions. Why should a Briton be starved and overworked—be called upon to face grisly death in badly found, undermanned ships—simply that his brethren ashore, who live far from the sound of the sea, should get their bread at halfpenny a loaf cheaper ? He does not see the logic of it, and he watches for a chance to compete in the world's struggle under fairer conditions. Like every other man he has his price that price a fair wage for a fair day's work. The mistake is that the man is called upon to do as much work in one day as would last the average member of a working-man's guild a week, and this under conditions that would arouse indignation and utter fear in the hearts of the ordinary man. And for this day's work he is paid two shillings sterling or two and six at the outside ! In addition to this he has permission to stow his bed and blankets in a reeking den, cold as the Arctic in winter, generally damp ; like a hothouse in summer, and always, summer and winter alike, infested with obnoxious vermin. This is putting the case baldly ; but the foreign element is found mostly in sailing ships, and these conditions hold aboard very many ships of this type actually known to the writer.

In common fairness it must be added that Jack is given a certain amount of food, and of this the less said the better. Its utmost value is less than one shilling, so that the entire result works out as follows: Jack receives the equivalent of three shillings a day with some odd coppers, and lives rent free.

**A
Cut-throat
Policy** For what is really the wage of a growing youth, a wage that would be sneered at

by a collier or a mason, Jack must face death at all hours of the day and night; must be prepared to work twenty-four hours a day if the need arises and must always remember that for some months out of each year he is without employment, and compelled to pay an utterly unreasonable price for permission to live ashore. That is the case in a nutshell. And then the shipowner driven to it by the great British Public, my readers!—comes along and says, "We must contrive to do with two men less in each crew." It is done because it has to be done, but Jack can only stand a certain strain. He is ready to do three men's work, he jibes at doing that of four. So he retires from the unequal contest, and lets the alien come in, the man to whom the sordid misery of a ship's fo'castle is luxury, who has fared on smoked fish and black bread all his life, who, because the blood of generations of serfs is in his veins, will take as much slave-driving as is necessary to ensure the working of an undermanned ship under present conditions, without a complaint, and who will be more than content with a wage that represents twice as much as he would earn in his own country. Alien Jack ousts British Jack, and the tale is told. Not completely; the next European war will provide the sequel to this quaint narrative.

A true to didactic sermonising Merchant Jack, such of him as remains, is an interesting study. I have met him all over the world, in the strangest places, and he rouses my admiration. I have

seen him in his fo'castle, gnarled of hand, bronzed of face, using tobacco in a manner to arouse disgust in sensitive souls; grumbling always, yet always with a grin beneath the growl. It is here in the sea-parlour that you see him as he is, when the brain is soothed by the kindly tobacco-fumes, and a general expansiveness takes possession of him. Then he will yarn away casually without dramatic passion, simply, matter of fact to the verge of prosiness—about happenings that, recorded in a book, would outvie the most stirring deeds of the British navy or the British army. How such and such a ship faced disaster for so many days, and was only saved by the men venturing aloft, at imminent risk of their lives, after the captain had bidden them not to go, and cutting away sails or masts, thus enabling the overmasted ship to ride in safety. How such and such a ship sighted a vessel in distress and rescued her crew—all told with a profuse adornment of strange oaths, blood-curdling blasphemies: but, to those who know, records of unfaltering heroism of the most gorgeous kind.

That is Merchant Jack; not the slouching man who reels from the door of a garish public-house and collapses into the gutter to lie there helpless in the mud.

They are quaint men when met on their own ground. I have seen types that would arouse the mirth of a professional humorist—notoriously hard to rouse. I remember once a ship leaving a port abroad; her original crew had deserted, and a crew of runners had been shipped. One of these men was an

**A
Picture of
Jack**
elderly Scot; he came aboard with a sailor's bag. That night he unpacked his kit—it had been supplied by some philanthropic boarding-house master. It contained, in addition to lavish packings of old newspapers, one piece of looking-glass, half a bar of soap, a sheath-knife, and—*O mirabile dictu!*—a pair of patent leather dancing slippers! That was his outfit for a winter voyage



MUTINY!

Suddenly the skipper has to withstand the frenzied rush of a crowd of maddened lascars. Then is the time when calm-eyed courage and brute force must go hand-in-hand.

across the Pacific! There was not even a bed, and on the following morning Scottie drew up his garments and disclosed for my especial benefit long red ridges down his side and thighs.

"They bunk boards are uncommon hard!" he said simply. That was all. It was part of his lot—he was quite ready to endure. Think of a workhouse pauper being asked to endure those conditions!

One interesting fo'castle man I think of frequently. He was a type of sailor all too uncommon; loyal to a fault, ready to fight a dozen men who should attempt to vilify his ship or her officers, a glutton for work when work was necessary, and a magnificent loafer when the need was not pressing. I saw that man, blood-mad, challenging an entire ship's company to fight on one occasion. He had got into the hands of the crimps ashore; he had been filled up with raw spirit; he could not distinguish between his best friend and his worst enemy. He walked aft and bearded the captain in his cabin; aye, accused that veteran to his face of being a robber and a coward. The same man, having found a bottle of spirit at sea, went to the cabin in mid-Pacific, and insisted on being paid off forthwith and sent ashore—he was three thousand miles from the nearest land! That man openly boasted that he had spent seventy-five pounds in one week's spree. These are not the traits which I speak of admiringly. But that same man once stayed at the ship's wheel without a relief for twenty-two hours, in the middle of the most awful gale that I have ever known. The physical and mental exertion of steering a ship through two hours of a living gale like that is enough to make hardened men swoon but Rhys stayed there for twenty-two hours, and saved the ship. They tried to relieve him; as soon as he relinquished his grip of the spokes the

ship broached to, and it was a miracle she did not sink there and then. Back went Rhys—he made no unseemly bobance about it and took the spokes. After that, though he was advised to leave the wheel repeatedly, he stuck there.

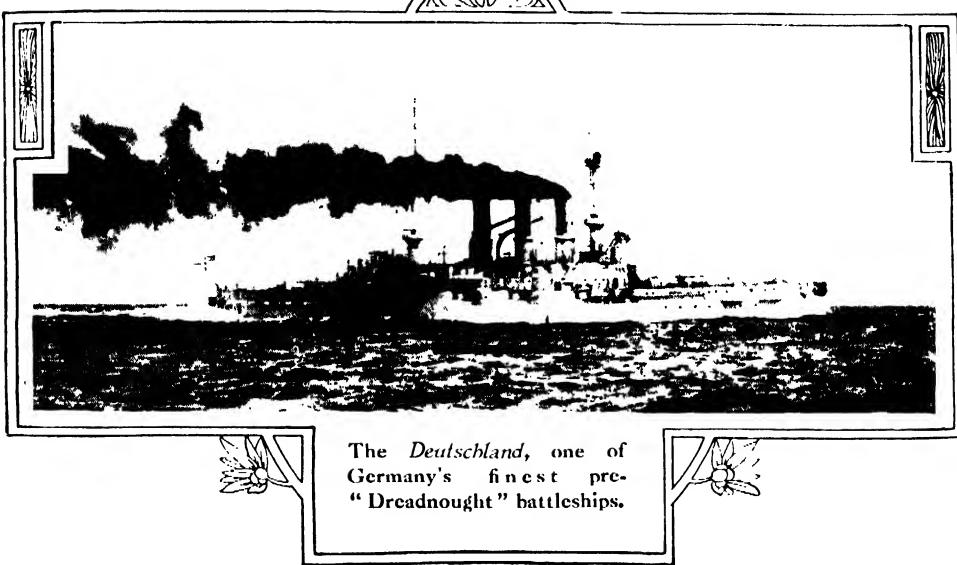
"I reckon I've about got the hang of her," he said simply.

I have seen that man under other conditions. He knew everything that could be known about the sea; usually he spoke sailor talk; at intervals, unguarded ones, perhaps, he spoke as a man of education. Once, when he was ill and communicative, thankful for a little sympathy, I got beneath the coarse exterior, and found out something. He had been an officer in the Royal Navy, a man of promise; until he had fallen. That was all. But if our merchant service could show many men like him I think it would be a happy day for England. He had many faults; he had more virtues, for he was a sailor to the core.

Such then, for better or worse, is the Merchant Sailor. A child at heart, a strong man, and a gentle. His is a life of constant warfare against overwhelming odds; and yet, in addition to waging this fight, he is ready always, thank God! to do a little more, a little outside the bond; and our newspapers tell of that doing. Watch him there, aloft with his companions in a roaring, howling hurricane, pounding the iron-hard sail with bruised and bleeding fingers, fighting desperately for every inch of canvas they drag up to the yard; see him again, a mere speck in an infinity of white-topped green, his rounded back swaying to the drag of the heavy oar, grim death stalking him on every foot of his way, as he carries a message of life and hope to the dying. That, I say, is the British Merchant Seaman.

FRANK H. SHAW.





The Race for Sea Power

THE first step in our consideration of the naval strength of the Powers must be an understanding of the various units that go to the making of a modern battle-fleet. Then we shall have a definite standard for comparison, and a means of appreciating the aims and ends of the rulers and projectors of navies.

It may be taken for granted that in time of war the most important vessels will be the battleships, and it was the evolution, by Great Britain, of a vastly improved type of battleship in the "Dreadnought" that set the Powers busily building so that no one of them should obtain a vast accession of strength by getting a big lead in the possession of huge fighting machines. The work of the battleship will principally be done in consort with her fellows, just as it was in the past, though naval tactics have altered.

Her portion will be to take the hardest punishment and to hit first and often.

In designing a battleship one of the first considerations is that it should not roll or heave to any great extent, providing what is known as "a steady gun-platform." Our own *Dreadnought* is a case in point. She has proved to be a remarkably steady gun platform but is a most wet and uncomfortable ship.

The modern practice, developed in the "Dreadnought" type, is to arm a battleship with a large number of the biggest type of guns. In the placing of these an arrangement is necessary that will allow as many as possible to be fired on a broadside. Our latest battleships can fire eight of their ten twelve-inch guns on either side, but it seems probable that the newest German ships will be able to discharge all twelve of their twelve-inch weapons on a broadside. The new United States battleships will be armed with ten twelve-inch guns, all of which will be available on

either side. However, all round firing is also an essential, and here the arrangement adopted by our designers shows a distinct advantage over that adopted by

protection as possible to the vitals, and a protective deck of some two inches of armour steel was all the other defence against shot and shell that was deemed

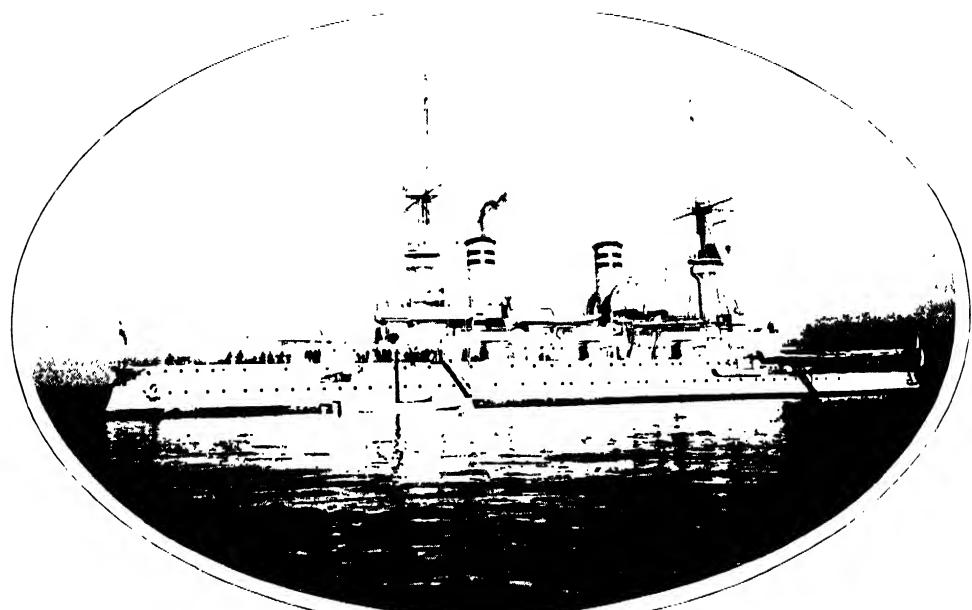


Photo A. Romer, Kiel.
The *Kaiser Wilhelm der Grosse*, a typical German battleship.

any other Power. The turrets on our ships are also placed further apart than those on the ships of other nations, so that a shell bursting inboard could not put two turrets out of action at once.

The general character of the British improved "Dreadnought" has been described in a previous article, and needs no further description.

The work of the cruiser is very aptly described by Mr. Rudyard Kipling :

"For this is our office : to spy and make room
As hiding yet guiding the foe to their doom,
Surrounding, confounding, to bait and betray
And tempt them to battle the sea's width
away."

Great speed is one of the primary considerations of a cruiser's design, and at first armour was sacrificed that this class of fighting-ship might have a heavy armament and a high rate of travelling. • The coal was arranged to give as much

necessary. The name "protected cruiser" describes them, and of the older very unprotected type we have only a few (about seventeen) which are relegated to the third class. The second- and first-class protected cruisers have thicker armoured decks and more protection to engines, guns, and conning-towers. Not even the biggest of these have any armour belts, and none have been laid down in the British navy since 1897. In 1898 we commenced to build armoured cruisers of a higher speed and with a far greater capability of resistance. The very latest cruisers, of which the British "Invincible" class are the best examples, are really very swift battleships of the all-big-gun type. They can steam at twenty-eight knots, and at this immense speed burn 500 tons of coal a day as well as 120 tons of oil. The cost of an "Invincible" is one and three-quarter millions of pounds sterling.

The Race for Sea Power

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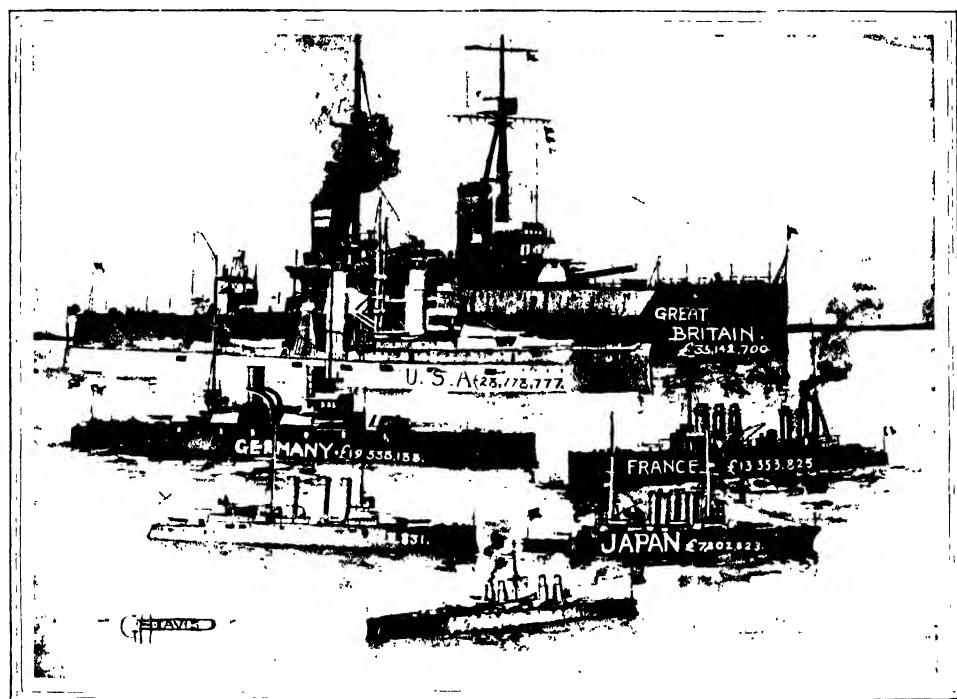
This is an immense change from old ideas which held that cruisers should be small and cheap.

"Scouts" are a smaller kind of cruiser, and together with destroyers, torpedo boats and submarines make up what may be termed the "minor navy." A navy of the size of that of Great Britain has in addition a large number of gunboats, sloops and torpedo-gunboats for use in protecting fisheries and other small interests, and there are as well a goodly number of depot ships, repair ships and such lightly armed or unarmed vessels for special duties.

Such are, very briefly, the component parts of a fleet. The battleships are the main strength, and may be compared in

weights; they are of lighter build and move swiftly; they will take punishment only if they have to, but much prefer to hit hard and dodge the return blow. Protected cruisers can take very little punishment, and as for the scouts, destroyers and torpedo craft it's hit and run with them, though the Russo-Japanese war proved that they could survive a deal more pounding than had been generally supposed. The submarines are almost an unknown quantity outside theory, but their functions are obviously of the hit and run order, though even one submarine, if it could only get unnoticed among a hostile fleet, might do a deal of hitting before it sneaked off.

Experts differ as to the fighting value of



What the seven great naval nations spent in 1910 in the race for sea power. The size of the ships approximate comparatively to the millions of pounds sterling voted by the respective Governments.

boxing parlance to heavy-weight fighters. They can take a deal of punishment and yet continue to deliver pounding, smashing blows. Armoured cruisers are middle-

weights; they are of lighter build and move swiftly; they will take punishment only if they have to, but much prefer to hit hard and dodge the return blow. Protected cruisers can take very little punishment, and as for the scouts, destroyers and torpedo craft it's hit and run with them, though the Russo-Japanese war proved that they could survive a deal more pounding than had been generally supposed. The submarines are almost an unknown quantity outside theory, but their functions are obviously of the hit and run order, though even one submarine, if it could only get unnoticed among a hostile fleet, might do a deal of hitting before it sneaked off.

and many other minor points have to be taken into consideration, and even then it is necessary, if a true estimate of sea power is to be prepared, that the men who man the ships should be considered.

The best standard that can be devised for practical purposes is undoubtedly that invented by Mr. Fred T. Jane, and

A Standard for Comparison used by him in his "Fighting Ships," the one essential work of reference alike for ex-

pert and general reader. This standard is a purely mechanical one, and of necessity leaves out of consideration the human element. It accords to battleships of the "Dreadnought" type and those since built 100 per cent. of fighting value, and to cruisers of the "Invincible" type and those since built 70 per cent. of fighting value. Earlier types have a less percentage according to their worth. Of ships which have, according to this standard, 50 per cent. and over of fighting value, Great Britain has this year, actually complete and at sea, the large number of fifty-nine, including the six ships of the "Canopus" class and the nine "Majesties," both of which classes are only given 50 per cent. of the "Dreadnought" value, though they are still in very efficient fighting trim.

Next on the list comes the United States with twenty-seven ships; third is Germany with eighteen, and Japan follows with sixteen. France and Italy have fifteen, and ten ships of over 50 per cent. value respectively. Practically speaking, this standard of comparison excludes all ships laid down previously to 1895; and, as a matter of fact, most of the foreign vessels are of a much more recent date.

The German navy is, without doubt, the most interesting to us in this country, partly because of the great energy with which she has recently followed her ship-building plans, and partly, also, because of the great secrecy that has been observed in regard to these plans until quite recently. Even now, at the time of

writing this article, it is not quite certain that there is not yet another ship of the "Dreadnought" type building that has not been accounted for in any of the published plans.

The admirable system of training used in the German navy has given her a really splendid body of men. They are smart in appearance and well-disciplined; and their gunnery, in all but the roughest weather, is excellent. But against this in the balance must be placed the fact that the German nation has practically no sea traditions. Her navy, as it exists to-day, is the creation of one man—the Emperor. Presumably the slow growth of years is as necessary to a navy as it is to a tree if the stress of rough weather is to be braved, and nobody can question the stiffening effect of tradition when there is any fighting to be done.

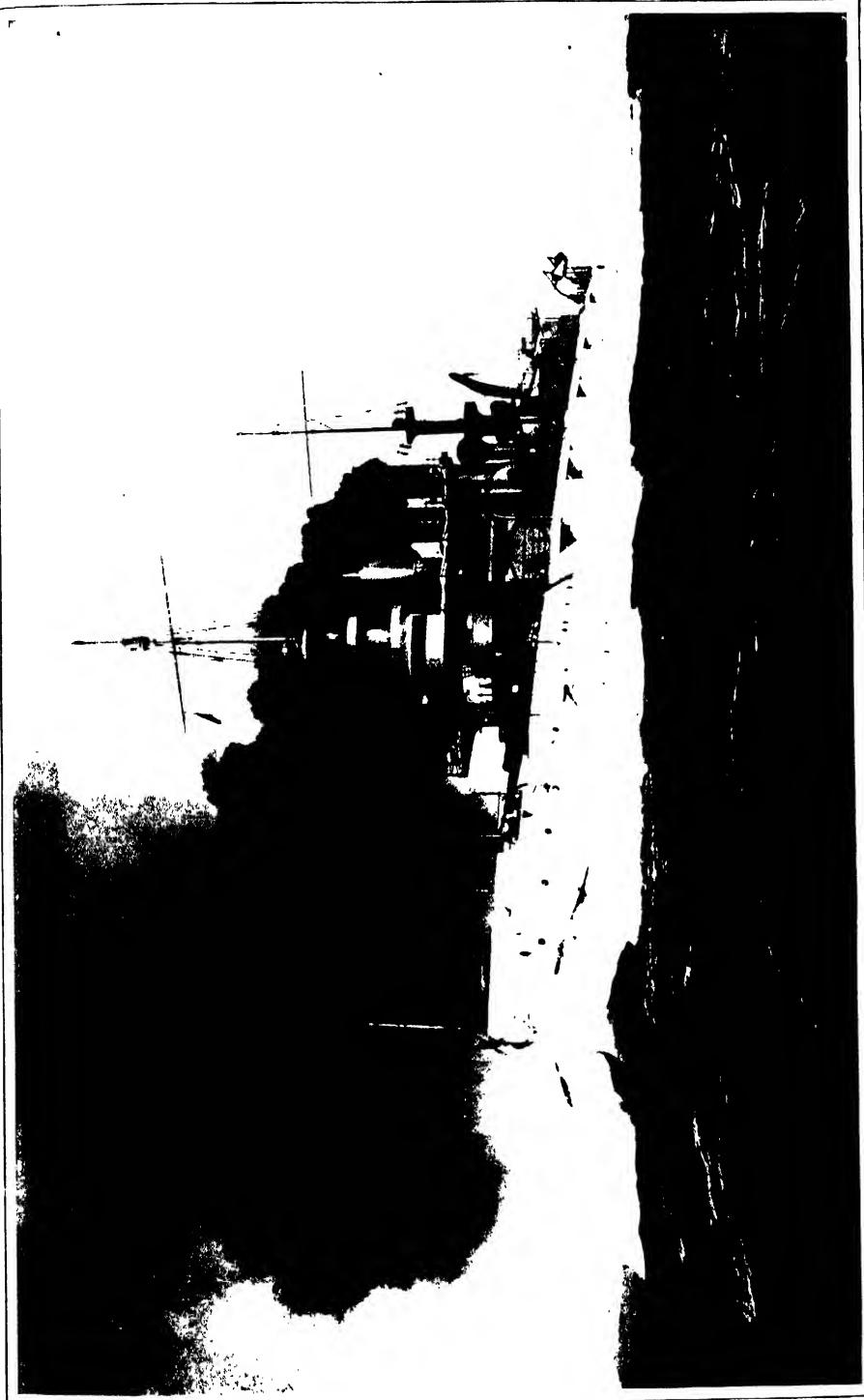
The older German battleships are, many of them, of a somewhat topheavy construction, and are not very steady gun platforms in anything of a sea; but in their later ships this design has been completely altered in favour of a cleaner build that must improve the seaworthiness of the fleet.

The two new German "all big-gun" battleships, *Rheinland* and *Posen*, which are just completing (both were to be ready between February and March, 1910) are fine vessels of a very good class, though they are not equal, either in speed or hitting power, with our own improved "Dreadnoughts" ("Bellerophon," etc.) that were completed in 1909. Our "Bellerophon" class can give these two ships a knot and a half in speed, and can discharge on a broadside nearly seven thousand pounds of metal against the German's six thousand.

The New German Battleships

The latest German battleships now building are very "beamly," they will, in fact, only be five times as long as they are broad; whilst in our "St. Vincent" class, three ships of which are to be completed this year, the relation of

The United States battleship *Minnesota*. She is a grand sea-boat, and can, under pressure, steam at nearly 19 knots. The "Kansas" class, to which she belongs, is quite equal to Great Britain's fine "King Edward" class, and is second only to the "all-big-gun" type.



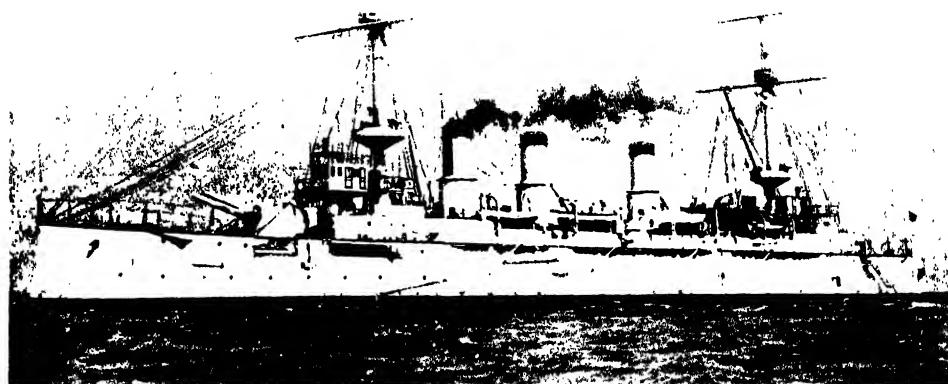
The Sea and its Story

length to beam is about six and a quarter. On paper the German ships are only losing half a knot of speed by their great beam, for they are designed for 20·5 knots, whilst the "St. Vincent" class are to make 21 knots. It is said that in these new German battleships three big guns are to be mounted in each turret, the usual practice being to mount only two. The obvious disadvantage in this mounting is that one shell may place all three out of action at once.

ten submarines ready, and others are building.

All the battleships, cruisers, etc., of the German navy are painted a light grey—masts, funnels, hulls and all—and have distinguishing bands on their funnels. The smaller vessels vary in shade between dark brown and black.

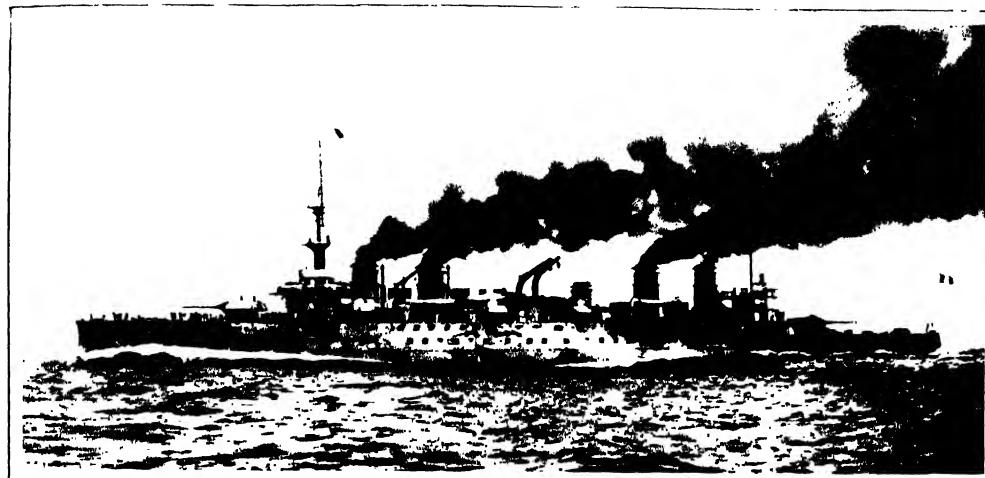
The fleet of the United States has recently triumphantly drawn attention to itself by sending sixteen ships on a little thirteen thousand mile jaunt from



The Japanese cruiser *Azuma*. The clean build of most Japanese warships makes them very British in appearance.

In the German navy the cruiser is not developed to anything like the extent, even comparatively, that it is in ours. Their cruisers number but forty-five, only ten of which are armoured; whilst the British navy has forty armoured cruisers and eighty of the protected type. The German destroyers are really first class craft; and can, most of them, make anything between 25 and 30 knots in rough sea. The torpedo craft are not of very great importance, and it is said that their torpedoes, except the latest type, are not very reliable. There are nine or

the Atlantic to the Pacific coast without a serious breakdown, keeping time all the way, and has shown, as was only to be expected from such a country, that their navy is progressive in every way. Second only to that of Great Britain, both in numbers and efficiency, the United States navy is developing along original lines in many particulars, and is experimenting in directions that may give them an important lead. It is a young man's navy, and the bait of commissions to be obtained by men of the lower ranks is attracting to it a high order of intelligence; whilst the abolishing of the line of

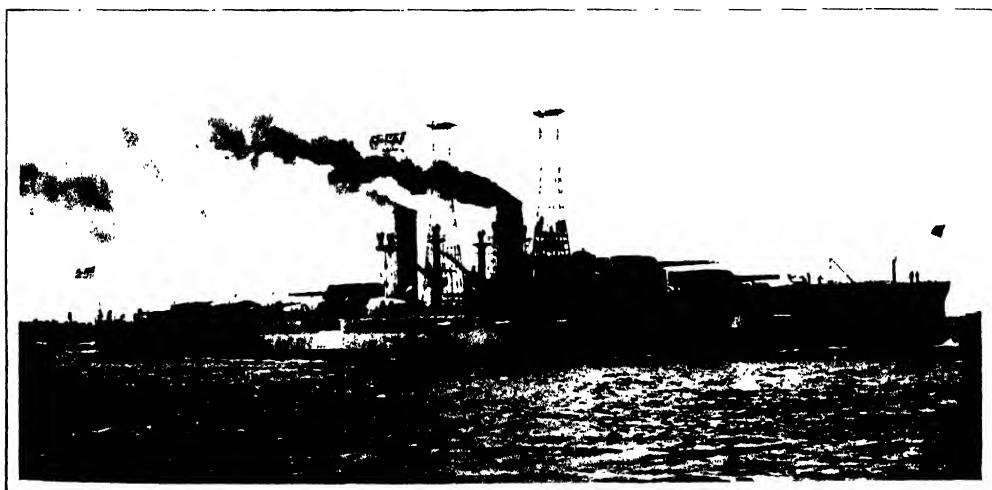


The French cruiser Jules Michelet, which was completed for sea in 1908. She is typical of the somewhat bizarre appearance of the French warship.

demarcation between executive and engineer officers -making them, in fact, interchangeable-has proved its wisdom beyond doubt.

The United States navy has four "all-big-gun" battleships ("Dreadnought") now completed, and two more will be ready next year. The very latest ships are not fitted with masts but with a kind of miniature Eiffel tower on which the fire-controls, etc., are placed, and all the

battleships are now fitted with this light "military mast." A feature of the big-gun arrangement in the United States navy has always been the placing of two turrets together, one higher than the other, so that the higher pair may be fired in the same direction and at the same time as the other. By this means also all the turrets are placed directly over the keel. It is probable that this system will be used for the first time in the British navy

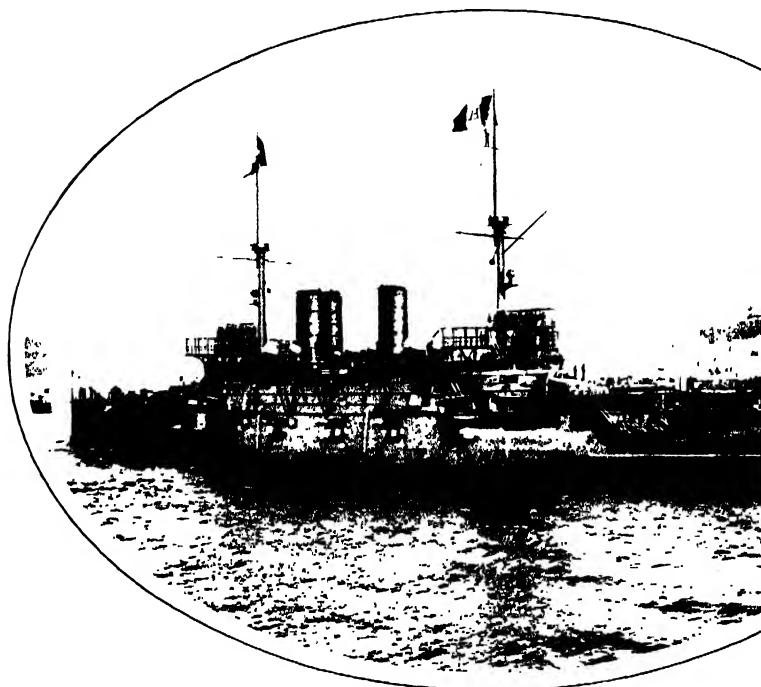


The United States "Dreadnought" type battleship North Dakota. All the United States battleships are now fitted with skeleton fire-control masts.

in the battleships *Hercules* and *Colossus*, now building.

The States have, at the time of writing, laid down no "all-big-gun" cruisers, but they have four 22-knot armoured cruisers completed within the last three years, and six other fully armoured

sea traditions of the French nation the navy is in bad repair at the present time. Discipline is very lax, and it will probably take years to undo the harm that has been done. French battleships and cruisers have a character all their own, and are usually to be easily recog-



Regina Margherita, one of Italy's battleships.

crusiers all completed within the last five years. Among smaller craft there are a large number of destroyers recently completed or building, all of which are fitted with the wireless telephone. The United States submarines are stated to be of an undeveloped type.

The colour of the United States ships is being changed to slate. The old colour was white hulls, yellow masts, funnels and upper works. Torpedo vessels are at present sea green, but may shortly be changed to a drab.

The French navy is not in a very high state of efficiency, and is just emerging from a period of stress, caused by dockyard neglect. Despite the long and honourable

nised by their massive upper works, or by the weird and wonderful cowls fitted to their funnels. The lower ranks of both the British and German navies hold the opinion, or did until quite recently, that the French boats are no good at all in anything of a sea. The very pronounced curve or "tumble home" of the sides of most of the larger vessels may have given rise to the opinion, for there is no doubt that many of them are excellent sea-boats. France will have six "all-big-gun" battleships ready next year and the year after.

The outstanding feature of the French navy is the excellence of her "mosquito" craft, of which she has a large number.

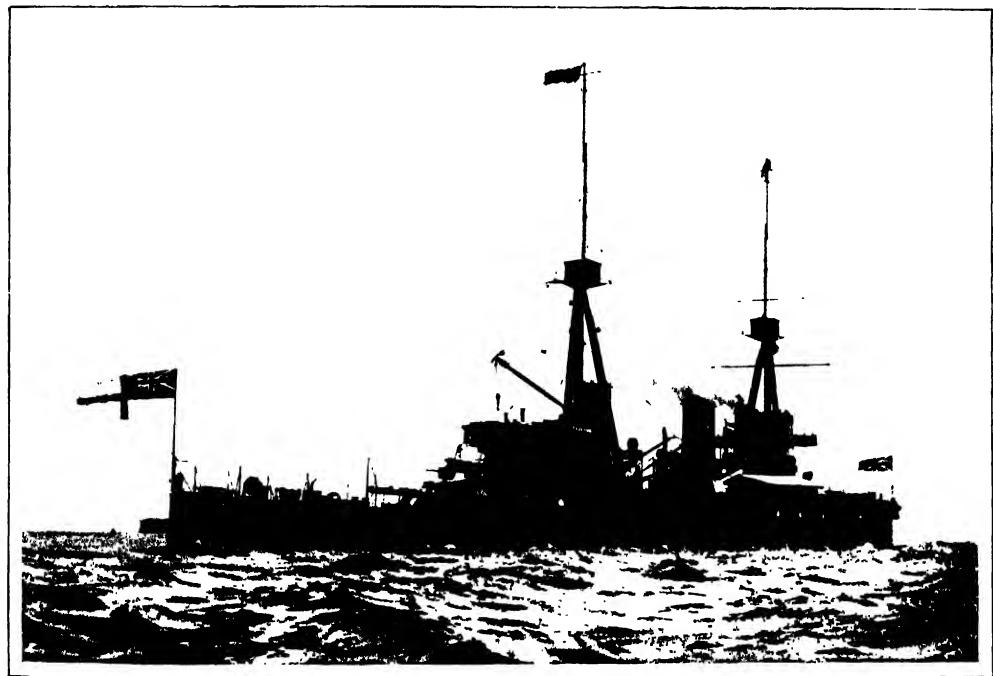
The officers and crews of destroyers and torpedo craft are very expert, and execute all manœuvres in fine style. The "submersible," or seagoing submarine, has received a large amount of attention, and has been brought to a very fair state of perfection in the more recent designs. There are sixty-three of these built and building, which, together with the thirty-seven ordinary submarines for harbour defence, make a very fine fleet of under-water craft.

The big French ships have black hulls with white upper works and black funnel tops. Destroyers and torpedo boats are light grey, whilst submarines are coloured sea-green.

The ships of the Japanese navy, save

upper works which distinguishes our best ships, and are generally well found. Japan is the fourth of the important naval powers, coming between Germany and France in the list. The officers and men are enthusiastic, and have brought the fleet to a high state of efficiency. There are well over a hundred destroyers and torpedo boats in commission and others building, and increased attention is being given to submarines. Japanese warships vary in colour, but are mostly of a neutral grey.

A peculiarity of the Italian navy is that its big ships are not divided into battleships and cruisers, as are the fleets of other powers, but are mostly of a "battleship-cruiser" type, approximating to our big armoured cruiser. Many of the ships are



H.M.S. Indomitable, Britain's latest all-big-gun cruiser. She was designed for 25 knots, but does 28 in the hour. At full speed she burns 500 tons of coal and 120 tons of oil a day.

those captured from Russia, are more like the British in general appearance than those of any other power. They have the clearness of outline and absence of heavy

excellent in every way, though there are few of high fighting potentiality when judged by recent standards. She will have two huge "battleship-cruisers"

The Sea and its Story

of 19,000 tons displacement in 1912, if present plans are adhered to.

Russia is the only European Power that has had actual experience of naval war in modern conditions, and her navy has not yet recovered from the disastrous effect of that war. She has very few battleships left, many having been sunk or captured during the war. Her "Dreadnoughts" will not be ready for some time. Russia maintains a fleet of eight battleships, some protected cruisers and smaller craft in the Black Sea.

Among the American republics Argentina leads the way, and is about to build two "Dreadnoughts." There are a number of British trained engineers in the fleet, which is, generally speaking, very efficient. Chili also talks of building two "Dreadnoughts," whilst Brazil at the moment owns the most powerful battleship in the world. South American navies give a deal of employment to British builders, engineers and armament

firms, though some of the ships of the smaller republics are converted yachts and discarded European war vessels. Costa Rica has the smallest navy in the world, boasting one Yarrow torpedo boat of 15 knots.

In the race for sea supremacy that the Great Powers are now engaged in it is safe to say that the nation with the longest purse will win. Size is on the increase, and with it cost per ton. In this race Britain has an advantage in that we can build at a cheaper rate than almost any nation of importance. But we must not lose courage because of the enormous expense, or rest for one instant on our laurels. Our finances are better than those of our biggest European rival, and we must remember that for many years to come our sea supremacy is likely to be one of the factors in assuring European peace. For the sake of humanity Britain must continue to "rule the waves."

ERNEST H. ROBINSON.



The "Dreadnought destroyer." A British submarine at full speed on the surface.



Fire at Sea

WITHIN a few days of the close of 1909 the White Star liner *Celtic* arrived at Liverpool with fire raging furiously in her hold. Yet not one of her four hundred passengers was aware that the voyage had been made under any but the most ordinary circumstances.

The outbreak was discovered when the good ship was in mid-Atlantic, by means of the really marvellous "tell-tale" arrangements with which all big passenger vessels are provided. It was quickly located among the bales of cotton at the bottom of No. 6 hold, and immediately the great fight between the fire demon and human ingenuity began.

The hold was closed up tightly so that every breath of air was excluded, then steam was turned into it to drown the growing flames that were eating upwards through and around and between the inflammable cotton. Meanwhile a section of the crew were busy strengthening the bulkheads and getting ready to cope with the fire even more strenuously should it extend beyond the hold in which they were trying to confine it.

Christmas Day came and went, and the captain took part in the happy festivities of his passengers, laughing and joking with them whilst in his heart lurked the terrible anxiety that must at all costs be withheld from them.

Night and day the fight went on, and though the creeping menace couldn't be wholly subdued, it was kept under it was not allowed to grow. At last, with what relief he alone knows, the skipper

turned his thousands and thousands of pounds worth of responsibility into the home waters, and soon had her fast in dock. Once there more energetic measures could be employed, and the fire was soon extinguished.

The most remarkable thing about this fire, after the skill and discretion displayed in dealing with it, is the fact that a great load of passengers could be kept so completely in ignorance of the danger that threatened them.

A
Remarkable Achievement

Cotton and coal are even more dangerous cargoes to carry than oil and gunpowder, and, until modern methods reduced the chances of spontaneous combustion and explosion to a minimum, were the terribly frequent causes of total losses by fire. In one year, fifteen or sixteen years ago, no fewer than thirty-two vessels laden with coal, outward bound from British ports, disappeared, of which it is absolutely certain that ten were burnt, and there is reason to believe that most of the others suffered the same fate.

In his "Round the Galley Fire," Mr. Clark Russell tells us of an American ship, the *R. B. Fuller*, outward bound from Cardiff to Valparaiso, with a cargo of coal. About 10 o'clock one night, when she was a little more than three weeks out on her voyage, her captain, Mr. Thomas Peabody, was awakened in his cabin by a feeling of suffocation, and found the place full of smoke, charged with the most nauseating odours. He rushed on deck and called for the officer of the watch. The chief mate came running out of the darkness forward and, before Captain Peabody could speak, cried out that the ship was



A cry of one of the seamen who had gone over the side with bare feet raised a kind of panic, and they hurried away from the ship.

on fire. At the cry the crew came tumbling up from the fo'castle and at once fell to work to fight the enemy. Every ventilator was closed and the cabin shut up in the hope of stifling the fire, and the men then gathered in the waist to watch and to wait. Not a trace of flame had yet been seen.

In a few moments, however—tightly as everything was closed—the ship began to leak out smoke from every seam. It was like a mist rising from the compact

earth. They now fell to work to bore holes in the deck; manned the pumps; fetched hose and buckets, and tried to drown the fire by pouring water into the cargo. Clouds of steam came up through the holes; and, as they faded away, were regularly followed by coils of black smoke and whiffs of poisonous gas that forced the men to work with averted faces. Still not a trace of flame was visible, but the captain gave orders to lower the boats.

As soon as the boats were alongside, the captain, wishing to fetch certain articles from the cabin, went down with the mate and four seamen. But they had not been there a minute before they were forced to run out, some of them vomiting blood, and lay down upon the deck

to recover in the fresh air. After a while they managed to victual the boats, and, having braced the ship's mainyards aback, rowed off to the distance of about half a mile and there lay on their oars and waited to see what the end would be.

The night was calm and the ship steady. The smoke rose up from her in a straight column and hung heavily above her, but hour by hour as they watched no spark or flame was visible.

Considering this they began to hope

that the fire was not so bad as they had feared, and soon after daybreak, though the smoke still crawled thickly from her, they headed for the vessel again. The captain's boat was the first to get alongside, and he jumped on board with a few men. The heat of the deck struck through his boots.

**Waiting
for the
End**

He put a hand to the planks. It was like touching hot iron. The very ropes were too hot

to handle. A cry of

one of the seamen, who had come over the side with bare feet, raised a kind of panic, and they all hurried into the boat. Even then, putting their hands to the vessel's side as low as the water-line was like touching a boiler full of steam. They rowed back to their old position.

Soon the gathering wind seemed to penetrate the vessel and send up thicker clouds, mingled now for the first time with sparks. Shortly before noon the mizzen-mast swayed for a moment and went over with a crash, and for the rest of the day the sparks continued to pour up from the hole thus made, tinging the sails forward with a dusky red.

The second night fell, and at length, just an hour after darkness, a jet of red flame shot out of the deck abaft the main-mast. By its light the men could see one another's faces. It sank and for a minute or two seemed to have died away. Then it leapt up again, higher this time, wreathing itself around the main-mast. Almost at once a second flame poured up from the fore-hatch, and in an incredibly short time the whole outline of the vessel was picked out with fire. "Every detail of the standing masts and yards and sails, the crosstrees, outriggers, and tops—all the furniture of the ship's decks, the boat-davits, the catheads, the martingale, the sprit-sail-yard—were expressed in flame. It was like the picture of a ship drawn in fire upon a black curtain."

The men sat silent in the boats and watched. For a while this picture shone upon the night. Then suddenly the burning hold opened, a tremendous

sheet of flame went up into the sky, and through the roar of it was heard the crash of the falling masts and yards; and with that the whole vision vanished "as you might blow out a candle." As the boom of an explosion came suddenly up against the wind the men were left in darkness, broken only by the glimmer of stars upon the black sea. Their ship gone, they tossed about for two days and nights, when they sighted a sail to the westward and rowed in pursuit. She was the barque *Paracca*, of London; and as soon as the boats were sighted by her, she lay-to and picked the poor fellows up.

Ships laden with wool or cotton are peculiarly liable to take fire from the heating of their cargo, in the same way that ricks often take fire ashore. It was this that led to the awful catastrophe that befell the *Earl of Eldon*.

The *Earl of Eldon* was a fine, strongly-built ship of 600 tons, and seemed in every way fitted to contend with all the usual dangers of the sea. On this, her last voyage, she was laden with cotton bales. She also carried a few passengers. Between decks the space was filled up with cotton bales, packed so tightly as to render it a matter of more difficulty to take them out than it had been to put them in. Unfortunately, before shipping, the cotton had become wet through exposure to a heavy rainfall. After going through a hasty process of drying in the warehouses, it had been pressed into bales by means of powerful screws; and it is probable that after shipment fire-damp may have been generated in the same manner as in hay that has been stacked damp. The number of people on board was forty-five—including three ladies and an infant, and the commander, Captain Theaker, and his crew.

**The Danger
of
Damp Cotton**

The ship sailed from Bombay on August 24th, 1834, and her subsequent adventures have been described by an officer of the Madras Artillery, who was one of the passengers. The following is his narrative:—

"On September 26th the trade wind seemed to have fairly caught hold of our sails and we anticipated a speedy arrival at the Cape. On the morning of the 27th I rose early—about half-past five—and went on deck. I found one of my fellow-passengers there. We perceived a steam arising, apparently from the fore-hatchway. I remarked to Hunt that I thought it might be caused by fire-damp, and, if not immediately checked, might become fire. The captain came on deck, and I asked him what it was. He answered 'steam,' and that it was common enough in cotton-loaded ships when the hatchways were opened. I said nothing, but the smoke becoming more dense and assuming a different colour, I thought all was not right, and also that the captain had some idea of this kind, as the carpenter was cutting holes in the deck just above the place whence the smoke appeared to come.

"I went down to dress, and about half-past six Captain Theaker knocked at my door, and told me that part of the cotton was on fire, and that he wished to see all the gentlemen passengers on deck. We assembled, and he stated the case to be this: That some part of the cargo had been spontaneously ignited and that he wished to remove part of the bales till he could come to the ignited ones, and throw these overboard. We, of course, left everything to his judgment. The hands were ordered to breakfast as quickly as possible, and set to work to discover the source of the fire. This having been done, he said there did not seem to be immediate danger, and that he hoped to avert it altogether. But at

**Hoping
for
the Best** eight o'clock the smoke

became much thicker and rolled through the after-hatchway—the draught being admitted forward, to allow the men to work. Several bales were removed, but the heat from below became intolerable, the smoke rolled out in suffocating volumes, and, before nine, part of the deck had caught fire; in short, the men were

obliged to stop work. The hatches were battened down to keep the fire from bursting out; the boats were hoisted out and stocked; and about half-past one, the three ladies, two sick passengers, an infant, and a female servant, were put into the long-boat, with two hundred and sixteen gallons of water, twenty of brandy, preserved meats and biscuits for a month.

A Dreadful Emergency

"It was now two o'clock, the hatches were opened and all hands set to try to extinguish the fire. The main-hatch being lifted and a tarpaulin removed, there was a sail underneath which was so hot that the men could scarcely lift it; when they did, the sparks and smoke came up worse than ever. The fire being found to be underneath that part of the deck, orders were given to hoist out the bales till the inflamed ones could be reached; but when the men got hold of the lashing to introduce a crane-hook, the cotton was found to be burned beneath, and the charred stuff came away in their hands.

"Our case was now bad indeed. We tried to remove the cotton by handfuls, but the smoke was so overpowering, that no man could stand over the hatchway, and water, in the quantities that we dared to use, only seemed to increase the fire; for had the captain ventured to pump water into the ship to extinguish the fire the bales would have swelled so much as to have burst open the deck and increased in weight sufficient to sink the ship; either way, destruction would have been the issue. Seeing the case to be hopeless the captain assembled us on the poop, and asked if we knew any expedient for extinguishing the fire and saving the ship, as in that case 'we will stick by her while a hope remains.' All agreed that nothing could be done; the crew were all sober, and had done their best in the fearful emergency.

"The heat increased so much that it became dangerous to leave the poop. The captain then requested us to get into the boats; told off, and embarked his



Suddenly the burning hold opened, a tremendous sheet of flame shot up to the sky, and through the roar of it was heard the crash of the falling masts and yards.

men ; and at three himself left the ship, just as the flames burst through the quarterdeck. We put off the two boats towing the long-boat, the ship's way having been previously stopped by backing her yards. When we were about a mile from the ship, she was in one blaze, and her masts began to fall in. The sight was

An Awful Sight

grand, though awful. Between eight and nine she had burned

to the water's edge ; then there suddenly came a bright flash, followed by a dull, heavy explosion—the powder had caught ; for a few seconds her splinters and flaming fragments were glittering in the air, then all was gloom ! ”

The story of the subsequent sufferings of the passengers and crew during the fourteen days they tossed about on a stormy ocean under inclement skies do not properly belong here. Suffice it that they reached Rodrigues in safety, and soon recovered from their really terrible experience.

Among the unnumbered perils of the sea and the cause, without doubt, of many a total loss, we have to reckon lightning and falling meteors.

Some few years ago the master of a ship arrived at Dundee with a singular but very circumstantial report. He said that when his vessel was in latitude 51° S. and longitude 80° W., a large meteor of dazzling brilliancy fell into the sea within a few cables' length of her. As it plunged into the water, it roared and hissed just like a mass of red-hot metal. The second officer, Mr. John Veitch, took particular notice of the phenomenon and the bright light cast by it across the sky, and concludes his entry in the log-book by surmising that, “possibly, some ships that have gone a-missing may have been struck and sent to the bottom by such meteors.” There is no reason to doubt that, had such a meteor struck the ship, it would have cut through her like a fiery sword.

On the peril of lightning, we may quote an old extract from the log of the *Ville de Lyon*, an American packet of 800 tons

burden, which put into Plymouth Sound in June, 1837 :—

“ At 10 p.m., Barfleur Light bearing S.S.W., distant about fifteen miles, they experienced a heavy squall, from W.S.W., with rain. Whilst in the act of taking in sail, the ship was struck by lightning. The electric fluid descended by the main-topsail-sheets, passed through the bolt into the passage-way leading to the cabin, thence ran along the bell-wires in the steward's pantry, melting those connected with the larboard state-rooms, and passed through the side into the water, starting several of the tree nails, and ripping the copper. Two men engaged in hauling taut the main-topsail-sheet were instantly killed, and two others were hurt. Within a minute after, another shock, still more severe, struck the ship in the same manner as the first, and escaped in the same direction. A passenger, who was in the steward's pantry examining the effects of the first stroke, was slightly injured in the head by the second. Notwithstanding the appalling scene, perfect order was observed. Captain Stoddard immediately sounded the pumps, and examined the vessel in every part. The appearance of the lightning was most remarkable. When the fluid struck the ship, the explosion resembled that of a bomb. The vessel, both above and below the deck, appeared to be filled with fire. At 12 p.m. the wind moderated.”

Fire on modern steamers sometimes takes place from coal-dust explosions in the bunkers. This was the cause of the loss of the coal and iron ore tramp steamer *Tregartha* early in November, 1909. A stoker went with a naked light into one of the bunkers. Instantly a terrific explosion followed, and a sheet of flame swept through the ship, licking up all woodwork in its way. Despite the heroic conduct of the captain, who afterwards died of his injuries, and of the officers and the British portion of the crew, the *Tregartha* was gutted and became a total loss.

Coal-dust Explosion

On a Saturday evening in September, 1909, a fire was discovered on the R.M.S. *Lucania*, lying in dock at Liverpool. Though not properly a fire at sea, the story is an interesting one. When the fire brigade arrived on the spot in force it was found that the first saloon was alight from one end to the other.

Despite the fact that from two motor engines and the mains some 2,000 gallons of water per minute were poured into the burning steamer, says a *Daily Chronicle* correspondent, the flames gradually worked their way forward, consuming every particle of woodwork until they got into the steerage, and then travelling downwards played havoc in the forehold of the vessel.

At this time the heat was tremendous, and the flames, shooting high up from the vessel, attracted the attention of thousands of people on the Cheshire side of the river, whilst the dock itself was besieged by a vast crowd, which had gathered from all parts of Liverpool. The damage to the liner was now so great that it was decided to admit water from the dock. In addition water was also poured into her by four floating fire tenders.

This decision was arrived at about three o'clock on Sunday morning, and shortly after the water was admitted the liner heeled over. Her funnels came into contact with the cranes fixed to the quay sheds and were badly damaged at the top.

A fleet of tugs was requisitioned, attached to the *Lucania* by means of wire hawsers, and these pulled her into an

upright position, in which they held her until she settled firmly in the mud at the bottom of the dock.

At the time the liner heeled over, half a dozen firemen, who were on a gangway, were precipitated into the dock. All,



The sparks
and smoke
came up
worse than
ever.

however, were rescued, and were little the worse for their immersion. It was not until after ten o'clock on Sunday morning that the conflagration was under control, and midday had arrived before the fire brigade could relinquish their task and leave the badly damaged Cunarder to her owners and the insurance people.

The Merchant Ship in War

HOW many of the teeming millions that go to make up the population of the British Isles know how important it is for us to keep fully open and clear the great trade routes that supply the food for every one of us?

To-day we own thirty-seven thousand deep-sea ships (practically equal to the mercantile fleet of the rest of the world put together), and every one of these vessels requires protection in time of war.

We know, to defend our billion pounds worth of exports and imports, we are spending between forty and forty-five million pounds on our navy, but we must recollect the fact that in one year we eat thirty-three million quarters of wheat. Of this we grow seven and a half million quarters, leaving twenty-five and a half million quarters to be brought from Russia, America, India and Australia and which must have protection in transit in time of strife. And wheat is but a single item of necessary food we almost entirely import.

Remembering that the hot blood of a nation is stirred up very quickly, and war comes before a nation can get its breath, and further recollecting that now it is considered not necessary to formally declare war before striking the first blow, it is well that we are always preparing in peace for the dread moment of the opening of hostilities. The Imperial Defence Conference that has recently called the chief Ministers of our Colonies to London have treated this matter as one of the items of first importance; the

great Service journals week after week place the matter in a foremost place; schemes are always being worked out at the Admiralty to guard against the possibilities of a raid on our sea trade, whilst recent questions in the House of Commons show that our legislators are fully alive to the fact that the efficiency of the navy to keep clear our food-supply is the one great item upon which we have to depend for existence.

The Use of Our Navy

**We Must
be
Prepared**

declare war before striking the first blow, it is well that we are always preparing in peace for the dread moment of the opening of hostilities. The Imperial Defence Conference that has recently called the chief Ministers of our Colonies to London have treated this matter as one of the items of first importance; the

But we must recollect that our most powerful rival has but a North Sea frontier, and has no coaling stations in the Channel or Atlantic, and if his commerce destroyers got into the lines of communication between ourselves, the east and the west, they would have to coal from colliers, always a hazardous proceeding on the high seas. Further, thanks to the foresight of the first Lord Inverclyde, we have the subsidised liner. His brain first conceived the idea of fitting gun platforms to our big passenger boats so that in time of strife they could quickly become light cruisers. Mr. Ismay, following up the idea in a practical way, had these gun mountings fitted on the big White Star liners *Majestic* and *Tevtonic* then building; and from that day until the present time it has been the rule of Britain (with most of the big nations following suit) to encourage the big steamship companies flying the "red duster" to agree to let the Admiralty have full use of their boats at the first sign of war. It was with this active co-operation and encouragement from the Admiralty that the Cunard Company were able to build the magnificent liners *Lusitania* and *Mauretania* that to-day

hold the "Blue Riband" of the Atlantic. Each of these monsters could be quickly turned into a vessel of war by the fitting of the fourteen six-inch guns they are designed to carry. In their construction the idea of using them as light cruisers in war time was not for a moment lost sight of, and certain unique features were introduced into their construction. It was further agreed between Government and

to protect the vitals with a great thickness of coal, whilst the construction of the after body of each boat is that of a war vessel--the rudder being completely below the surface. Therefore, during hostilities, with every portion of their holds filled with corn, they could hurry back and forth, keeping up a weekly supply of over twenty thousand tons of wheat; their guns protecting them from hostile



A picture of the next great war. R.M.S. *Mauretania* using her speed and her guns to beat off a destroyer attack in mid-Atlantic.

owners that in time of peace all their crew were to be members of the Royal Naval Reserve.

The main decks were stiffened to carry the armament that makes them nearly as powerful as a "county" class cruiser; the lower decks were built so as to keep the Leviathan afloat even if holed in many places, and each boat is subdivided into 175 water-tight compartments that can be closed by the single movement of a lever on the bridge. The bunkers are arranged along the sides

torpedo craft, and their speed from the cruisers and battleships, and, if required, vessels of the "Indomitable" class could steam as escort.

During the next great naval war it is certain that every merchant ship will have to play its part, for to feed the 43,000,000 people that dwell in this univocalated citadel of ours four hundred pounds' worth of food must come through our sea gates every minute, not ceasing by day or night.

HORACE DAVIS.

White Wings and Brown



The First Sail.

TO the average landsman, though he may know a deal of machinery and possess a passenger's knowledge of the workings of a steamship, the sail-rigged vessel is a mystery, and the language of those who do understand her a philological quicksand wherein he is engulfed alive if he so much as venture a tentative toe upon it.

It is not to be wondered at that the subject of rigs and rigging, and the why and wherefore of the multitude of ropes that are used to support masts and spars and work the sails, should seem at first to be of a highly complex nature, enveloped as it is in a quaint language of ancient growth; but, after all, the rudiments are simple, and these once understood a fuller comprehension follows easily.

The simplest sail is merely a piece of fabric extended on a single pole to catch a wind blowing dead behind. Probably the first sailor, observing that the wind assisted him when it blew in the direction in which he was working, lashed his cloak

to an oar and making fast the bottom ends was wafted home, rejoicing in the grateful rest to his tired back and arms.

But sailing is not so simple as that. The wind as we know "bloweth where it listeth." It may be blowing from any quarter and at any angle to the ship's course, and to each of these directions a different name has been given. When, as in the imaginary case of the first sailor, the vessel has the wind right aft and is moving in exactly the same direction as the wind, she is "running."

Harnessing the Wind

When sailing as nearly in the teeth of the wind as she can possibly manage, a vessel is said to be "close-hauled"—the sheets being hauled well in and the sails flattened—or "on a wind," or "sailing close to the wind." It is the resistance of the water that enables a vessel to sail with the wind at right angles to the direction to which she is proceeding or even with the wind nearly dead ahead.

The vessel's hull being longer than it is broad it has to displace less water when moving in a forward direction than when moving broadside on. The wind fills her sails and she must move. The weight of water pressing on her bows is far less than the weight of water pressing upon her sides, consequently she takes "the line of least resistance" and moves forward. The finer a vessel's lines—that is, roughly speaking, the longer she is, within limits, in proportion to her breadth—the nearer she can sail to the wind, for the more weight her sides offer to the pressure of her sails in proportion to that upon her bows. Of course, if she is too narrow she

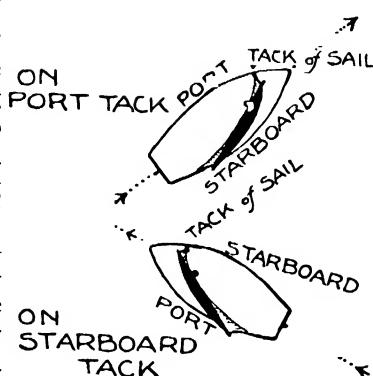
won't "stand up" well and runs grave risk of capsizing. No matter from what direction the wind be blowing, as long as it allows the ship to steer her course it is a "fair wind." Anything beyond this is a "head" or "foul wind," and when the wind is coming steadily ahead the ship can only reach her destination by making a series of zig-zags or "tacks," by each tack getting the wind sufficiently astern to drive her forward.

Suppose, for the sake of an example, that a vessel at Dover wishes to get down Channel and that the wind is blowing W.S.W. or directly up Channel. It is clear that by attempting to sail straight down she will only be blown backwards. Her only course therefore is to slant across for the French coast, and then back from the French coast to the English, and so on, until by means of these diagonals she finally clears the Channel. This making of tacks or "beards" is called "beating to windward," and with anything like a strong head wind progress is, of course, very slow. Indeed with a very strong head wind it would pay the skipper better to anchor in the Downs and wait until the wind shifted, unless he could afford a steam tug to help him on his way. A century back, when steamships were not invented and everybody had to de-

'All in the Downs' pend on wind, it was no uncommon thing to see between four and

five hundred sail of outward-bound ships anchored off Deal for weeks, waiting for an easterly breeze, and even now the safe anchorage of the Downs is often taken advantage of by large numbers of craft.

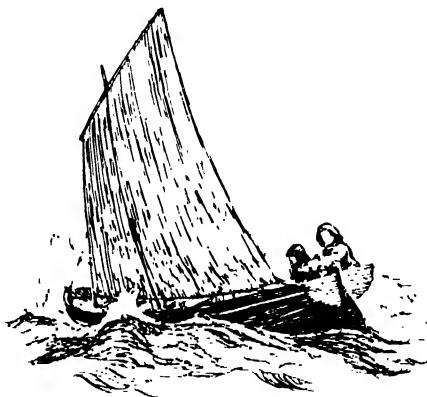
To return to "tacking." A ship is on the starboard tack when her starboard



When the forward corner or "tack" of the sail is secured to the port gunwale the boat is on the "port tack," and vice versa.

(or right hand) side is her weather side—i.e., when the wind is blowing against it; and on the port tack when her port (or left hand) side is her weather side. The shift from one tack to another is termed "going about"; and there are two ways of going about (1) by "tacking," (2) by "wearing."

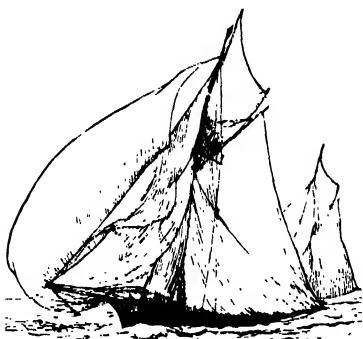
1. *Tacking*.—This is by far the commoner method of going about. Suppose that a ship is sailing on the starboard tack and the helmsman wishes to shift her to the opposite, or port, tack. He will put his helm hard "down"—i.e., to leeward, which in this case is the port side and by this action turn the *head* of the ship towards the direction in which the wind is blowing. For a moment or



A Deal Galley-punt: Lug-rigged.

two she shakes with her nose pointed dead at the wind and then comes round, the sails fill on the port side, and she is off on the port tack. At the moment when she is shaking with her nose against the wind she is said to be "in stays." If when a vessel is "luffed up" —another term for putting the helm down to leeward—she refuses to come up into the wind and drops back on her original tack she has

"missed stays." This may be a serious matter if the vessel has been held on one tack until she is close to the shore, for if, when she is "luffed up," she has not way enough to carry her round but falls back on her old tack, then she will run on shore and probably be wrecked. Square-rigged craft—this term will be ex-



A Racing Cutter with Spinnaker and Flying-jib set.

plained later—are liable to another form of misfortune when tacking. The vessel may come round just far enough to point her nose against the wind and stick there in stays, her fore-and-aft sails shivering but not filling on either side and her square sails taken aback. In this situation the vessel is liable to drift stern foremost on to the shore.

It may here be explained that the expressions, "put the helm down" and "put the helm up" come from the usual slant of a sailing vessel's deck in anything but the lightest air. The wind

"Down with the Helm" pressing on the sails forces the lee side of the hull down so that the weather bulwark is

higher than the lee bulwarks. Thus it follows that the tiller is put up towards the weather side and down towards the lee.

Certain rigs are much handier than others in tacking. In the cutter, for instance, one has only to let go the jib-sheets and fore-sheets on one side and haul them in on the other; the wind does all

the rest of the work. In an ordinary lugger, on the other hand, the sail must be lowered at each tack, and hoisted again on the other side of the mast.

By the way, the terms "on the port tack" and "on the starboard tack" are easily explained when one remembers this peculiarity of the old lug sails. When the wind is blowing from the starboard the "tack" is secured to the starboard gunwale, when from the port it is made fast to the port gunwale. Thus we have "port tack" and "starboard tack."

2. *Wearing*.—To "wear" a ship you put the helm up (*i.e.*, to windward) instead of down, and thus bring the ship round with her stern to the wind instead of her head (as in tacking). Though in certain cases this may well be the more advisable plan, there are many reasons why, as a rule, it should not be so. Among them is this very obvious one, that the chief force of the wind is applied to the end of the mainsail furthest from the mast, and therefore the violence with which this sail "jybes" or comes over (if your vessel be a cutter or any fore-and-aft rigged vessel) is terrific and may chance to snap the mast off short with the strain.

Lastly, while we are on the subject, let us understand the meaning of such expressions as "a beam wind," "a point nearer the wind," "within four points of the wind," etc. The compass, as everyone knows, has thirty-two points. And just as our compass is divided, so we may divide the whole horizon round our ship. Now, let us draw an imaginary line along our ship's deck from her rudder to her bowsprit, and obviously we shall have sixteen of these thirty-two points on the starboard hand and sixteen on the port. Consequently from right aft to right abeam will be eight points, and from right abeam to right ahead will be eight points. And four points will be midway between right abeam and right ahead—and there are smart fore-and-aft rigged craft (some racing cutters, for

The Dangers of "Wearing"

instance, and fore-and-aft schooners) that will sail even with the wind so far ahead as this. Square-rigged vessels cannot sail so close: their strength lies in "running"; but a clever skipper with a well-built craft will often manage to sail within six points of the wind.

This leads us on to the subject of rig.

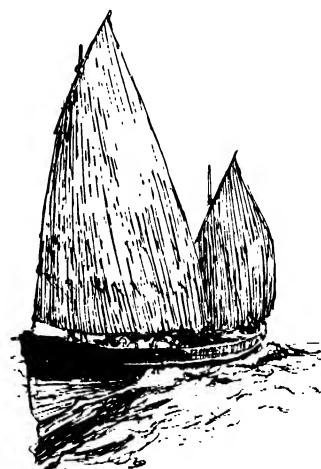
Varieties of Sail and Rig

The varieties of rig, and the different names borne by vessels in consequence,

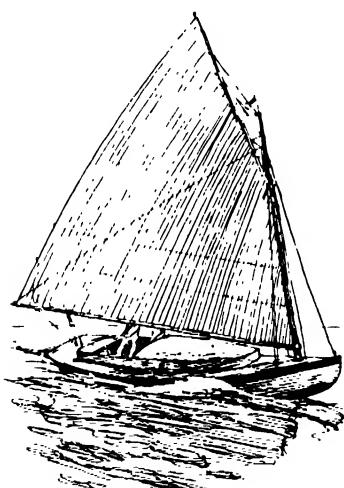
are almost countless. They are all the result of careful experiments in sailing, and to explain them all thoroughly is not possible within the limits of such an article as this. We may, however, study the main division and examine, to some extent, the influence of local conditions and explain why certain rigs are preferred in certain trades. Convenience has been the determining factor in the development of all the multitude of differing rigs that so confuse the landsman, and this question of convenience is one that it is nearly impossible for a landsman to under-

stand. Why, for instance, has that first simple sail devolved into such widely differing rigs as that used on the Chinese junk and the stately canvas of a British ship?

The two first points to note in deter-



A Scotch Herring Boat : Lugger Rig.



The "Cat-boat," a Pleasure Rig
much used in America.

mining the rig of any vessel are the number of her masts, and whether her sails are *square* (*i.e.*, set on "yards") or

horizontal spars across her masts) or *fore-and-aft*. Vessels may have one, two, or three masts, and indeed are often now rigged with four, five, or even six. Three, however, is the greatest number that need concern us, and if we count fishing-smacks and pilot-boats, in fact, all shipping down to the smallest craft afloat, it is probable that by far the greater number have only one mast.

The simplest, and without doubt the first evolved of all sails is the lug, which was originally a square piece of canvas hung on a yard across the boat. The need of sailing close to the wind has gradually altered the position of the yard until about three-quarters of its length now project from the mast.

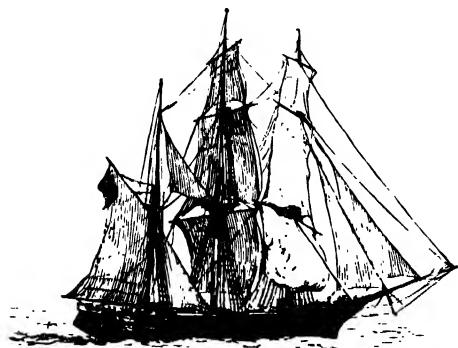
whilst its *tack*, which was formerly secured to the weather gunwale, is now made fast to the foot of the mast. Some peculiarities of the lug rig have been mentioned. Luggers often have a small mizzen-mast and are sometimes rigged with three masts.

Another very simple form of rig is the *sprit*, a piece of canvas in shape like a lug sail being extended by a sprit or yard

Some Simple Sails

The Sea and its Story

placed diagonally across it, its lowered end secured to the mast and the "tack" of the sail, and its upper end through a rope



A Barque Going About.

ring at the "peak." Thames barges are often sprit-sail rigged.

Undoubtedly the most perfect sailing boat for pleasure and speed is the cutter, which is fore-and-aft rigged with one mast only, her largest sail (or main-sail) being run on to the mast with hoops, and its head and foot attached to two spars, the upper and smaller of which is called a "gaff," the lower and heavier a "boom." She has three other sails besides her main-sail a "top-sail," and two three-cornered sails that are set in front of the mast: of these two the one ahead which reaches to the end of the bowsprit is a "jib," and the one behind it a "fore-sail," and for occasion she has extra sails such as the "spinnaker." This beautiful sail she hoists out on a boom when racing with a light or moderate breeze astern; nor shall you see in

The Racing Yachts this world a more enchanting sight than when three or four racing yachts have

extra sails for use in light airs, such as flying jibs, set over the jib; a balloon jib, which takes the place of both jib and fore-sail; and the spinnaker, which is hoisted to the top-mast head and extended on a light boom on the opposite side to the main-sail when running before the wind. Unnautical writers go into rhapsodies

over the spinnaker, calling it white gossamer, butterfly wing and other fanciful names, but the truth is it is difficult to manage and often more bother than it is worth.

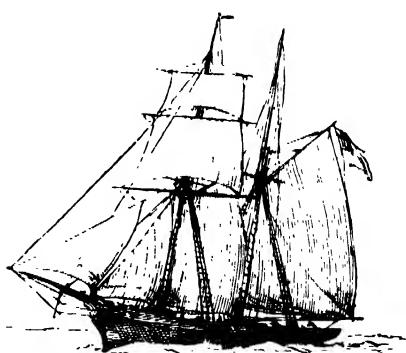
The yawl, or dandy, is a cutter-rigged vessel with a mizzen, or small mast right aft; this is also rigged with a cutter main-sail and top-sail.

Some authorities give the name dandy to vessels of the class

Two-masted Vessels

that have no boom to either main- or mizzen-sails, but as the name yawl is also given to boomless craft with main- and mizzen-masts the names must be taken as being practically synonymous. If the mizzen-mast and its sails is enlarged to any extent a yawl becomes a ketch and may properly be called a two-masted vessel, ranking with those important rigs, the brig, the brigantine, and the schooner.

A brig is a two-masted vessel, square-rigged on both masts—*i.e.*, with yards and square-sails on both fore-mast and main-mast. Note that the aftermost is no longer the "mizzen" but the "main" mast, and is the taller of the two.



The Top-sail Schooner.

A brigantine has her fore-mast square-rigged like a brig's; but her main-mast is fore-and-aft rigged, just like the mast of a cutter. She is really a link between the ketch and the brig, for her aftermost mast is the shorter of the two.

In the schooner, again, we have the

after-mast the taller, in two-masted schooners which are the most usual. There are two kinds of schooner, the fore-and-aft and the top-sail schooner.

A fore-and-aft schooner has no yards and no "tops" to either mast; but both her fore-mast and main-mast are rigged like a cutter's-mast. In fact, her rig is practically that of the cutter, *doubled*. Instead of tops she has crosstrees. A schooner yacht is always fore-and-aft rigged, whereas most trading schooners are top-sail rigged.

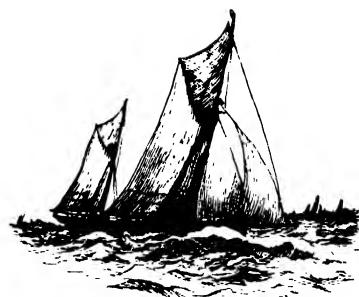
A top-sail schooner resembles a fore-and-aft, with this difference, that she carries two square-sails *on her fore-mast*



French Fishing Boat : Lugger-rigged.

—a fore-top-sail and a fore-topgallant-sail; but these sails are smaller than a brig's, and have lighter yards to carry them. Her main-mast is rigged like a cutter's mast.

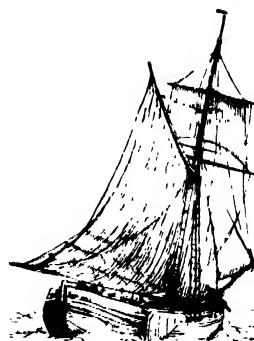
Schooners are about the handiest of all vessels by which I mean that for their size they can be worked with least effort and the smallest crew. When a schooner goes about, her sails require little management, but come over automatically almost; but the square-sails of a brig have to be brought round by letting go lee braces and hauling in weather braces; and if she has many sails set this is a long job. Sailors will tell you there is all the difference in the world between sailing a brig and sailing a schooner, and that the same man is seldom good at both. If accustomed to sail a schooner, he will not allow time for the brig's slower



A Smack : Yawl or Dandy-rigged.

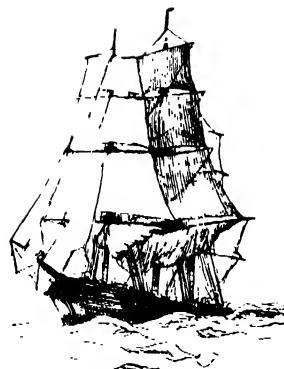
evolutions. "It's the rottenest kind of rig," says Captain Wicks in Robert Louis Stevenson's "The Wrecker," as he surveys the brig *Flying Scud*: "all blooming pocket-handkerchiefs!" Now Captain Wicks was a fore-and-aft sailor, and as the author tells us "could take a schooner through a Scotch reel, felt her mouth and divined her temper like a rider with a horse; she on her side recognising her master and following his wishes like a dog." But when Captain Wicks turned his hand to steering a brig, he was too hasty with her and ran her aground.

Further, it must be remembered that a schooner will sail nearer the wind, and that all reefing and furling of sails is heavy work on a square-rigged vessel, where the men have to go aloft and lie out upon the yards; and we shall under-



A Sloop-rigged "Billy-Boy."

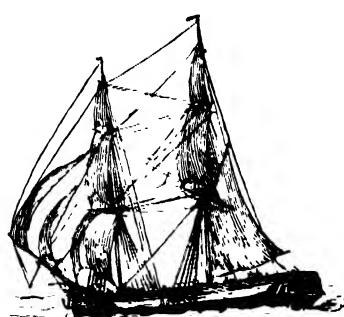
stand why it is that brigs are decreasing in numbers, though you may still find many afloat. The old collier-brigs that



A Full-rigged Ship.

used to tramp the North Sea between Tyne and Thames have been almost entirely driven out by steamers.

Lastly, among two-masted vessels may be mentioned the *Galliot* or *Billy-boy*. This form of vessel is common in Holland and not rare along the north-east coast of England, and its individuality lies rather in its hull than in its rig. Indeed a billy-boy may be sloop-rigged, or schooner-rigged, or ketch-rigged, or (for aught I know) lugger-rigged. But in any case she will have a very bluff bow with a standing bowsprit, and a round stern with windows in it. This is as picturesque a vessel as any afloat, with a good-humoured lumbering air about her; and is what sailors call "a good sea-boat," which means that she behaves well in rough weather and rides easy in the heaviest seas. Only she wants plenty of sea-room for her manœuvres, and is not at all the sort of craft to turn round in her own length.

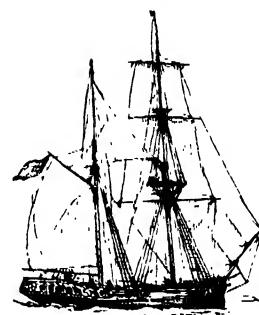


A Collier Brig.

We now come to three-masted vessels, and among these must consider the three-masted schooner, the barque, the barquentine, and the full-rigged ship.

The three-masted schooner is just like a two-master, except that abaft of her main-mast she carries a mizzen rigged just like the main-mast. She also has this peculiarity among three-masted ships that her fore-mast (which carries the square-sails) is higher than her main-mast and her main-mast than her mizzen. In ships, barques, and barquentines the main-mast is usually the highest, then the fore-mast, and the mizzen lowest of all.

There are also to be seen four, five and even six-masted schooners. They are not beautiful to look at nor to sail in, being usually manned with the smallest possible crew. These monstrosities of the



The Brigantine.

sea are as a rule fore-and-aft rigged with all the masts much of a muiness as regards size. The first three are, of course, fore, main and mizzen. Then comes the "jigger," "second jigger," and in a six-masted ship "third jigger."

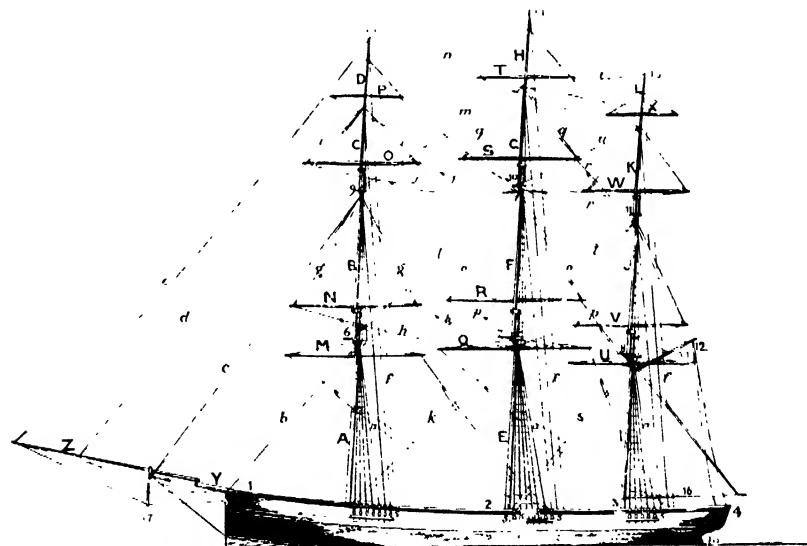
A barque is just a brig *plus* a mizzen of different rig. Her fore-mast and main-mast are square-rigged like a brig's, but her mizzen is fore-and-aft rigged.

A barquentine is square-rigged like a brig on her fore-mast only, but has fore-and-aft sails on her main- and mizzen-masts.

A ship, according to Act of Parliament, is "any fabric that is not propelled by oars," but to a sailor the word ship is

short for "full-rigged ship," which, as properly defined, is a three-masted vessel, square-rigged on each mast. However, a ship may have four masts, and as recently as fifteen years ago there was a five-masted ship in the Royal Navy. A ship is the only vessel, beside a schooner, to which the addition of a mast or two makes no difference. Take a brig and give her a third square-rigged mast and she becomes a ship. Take a ship and add as many masts as you please and she remains a ship, even if your new mast be a spanker-mast that is, fore-and-aft rigged like the mizzen-mast of a barque, though many would call such a vessel a four- or five-masted barque; and they are

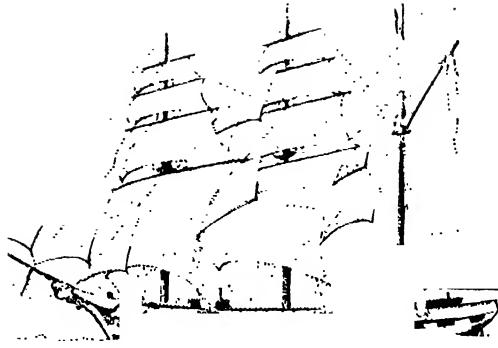
supported by Lloyd's Register. These large four-masters have their critics; but there are many reasons for their popularity with a certain class of owner. To begin with, they are undoubtedly fast sailers, making when close-hauled as many as ten knots an hour, and as many as sixteen when running free. They are also said to be very handy in stays. And further, ship-owners find that on the whole one big ship is more economical than two small ones. It needs fewer hands, and one captain and set of officers do instead of two. Thus we find that in the overseas trade it is only the big ships that are able to hold their own against steam.



THE WAY ABOUT THE RIGGING

A Guide to the Spars and some of the Principal Ropes of a Full-rigged Ship

A FORE-MAST	S MAIN-TOP-GALLANT-YARD	1 10	GALLANT-YARD
B FORE-TOP-M	T MAIN-ROYAL-YARD	1 10	
C FORE-TOP-GA	U CROSS-JACK-YARD	6 M	
D FORE-ROYAL	V MIZZEN-TOPSAIL-YARD	1 M	1-SWAY
E MAIN-MAST	W MIZZEN-TOPGALLANT-YARD	6 M	2-STAY
F MAIN-TOPMA	X MID-UN-ROYAL-YARD	6 M	3-PAY
G MAIN-TOPGALLANT-MAST	Z JIB-BUG	6 M	4-LINE
H MAIN-ROYAL-MAST	A1 GA	6 M	5-TRAIL
I MIZZEN-MAST			6-TRAIL
J MIZZEN-TOPMAST	a FOR		7-MAIN-TOP
K MIZZEN-TOPGALLANT-MAST	b FOR		8-FORE-LESS
L MIZZEN-ROYAL-MAST	c FOR		9-FORE-TOE-TOPMAST
M FORE-YARD	d FOR		10-FORE-MAST
N FORE-TOPSAIL-YARD	e FOR		11-CROSS-TELES
O FORE-TOPGALLANT-YARD	f BAC	1 10	12-FORE-MAST
P FORE-ROYAL-YARD	g FOR	2 10	13-FORE-TELE
Q MAIN-YARD	h FOR	3 10	14-FORE-TELE
R MAIN-TOPSAIL-YARD	SAIL-BRACE	4 P	15-MIZZEN-LESS
			16-MIZZEN-TELE
			17-BOOM-TELE
			18-GRUBBER



Unloading a Cargo

NOWADAYS, with competition keener than ever it has been in the history of shipping, unloading is a rush from beginning to end. The ship has hardly reached her port and obtained pratique before she is boarded by an eager crowd of stevedores, bursting with energy ; and almost as the first warp is passed ashore the first sling of cargo is hoisted from the hatchways and swung over the side. From that moment forward, night and day, Sundays sometimes excepted, sometimes not excepted, a steady trickle of merchandise sets out from ship to shore ; winches hiss and clatter, hatch foremen yell pungent oaths into the gaping chasms of the holds, men stripped to the buff perspire and labour like beavers down there below the water-line ; the wharves grow piled high with casks and cases, bales and packages, until the last parcel of cargo is ashore, and the stevedores and sailors are busy with broom and basket making all things seemly for the homeward freight. Sometimes a liner of fifteen thousand tons will reach her port one day and leave again discharged, swept, and reloaded within thirty-six hours.

That is putting the matter briefly and from the point of view of a casual observer, but it requires much careful forethought

and skilful management to bring about this state of being. Aboard first-rate steamers the crew have practically nothing to do with the cargo ; its handling is entrusted to experts who do nothing but handle cargo all their days, with a natural result that they have reduced the matter to a fine art, and can sling and heave weights that would stagger the unskilled. But the majority of these stevedores have been, at one time or another, sailors, men who know the value of strength and stability in tackles, men who will err on the side of too great precaution rather than trust anything to chance.

As the ship reaches her port the stevedores pour on board, and the boatswain of the vessel lays his stores open before them. Each derrick has already been fitted with its guys and gins large pulleys these latter, for the rope-falls to travel through when the derrick is hoisted aloft. There will be perhaps two derricks over each hatch ; perhaps, if the hatch is very large, four, or even six. Two stevedores scramble up aloft like monkeys, and before they have even unscrewed the shackles at the mastheads, the rope gantline has been overhauled, hitched to the derrick-span, and led to a steam winch so that the derricks are swaying up aloft rapidly. When the span has reached the mast-head the waiting stevedores give a cry, the winch stops

heaving ; a couple of turns of the wrist, a yell of " Slack away, below ! " and the long spar sags neatly into its place, raking over the hatch at an angle of some forty-five degrees, and plumbing the centre of the hold. This, being stayed amidships by guy ropes on either side, is the heaving-up derrick, by means of which the slings

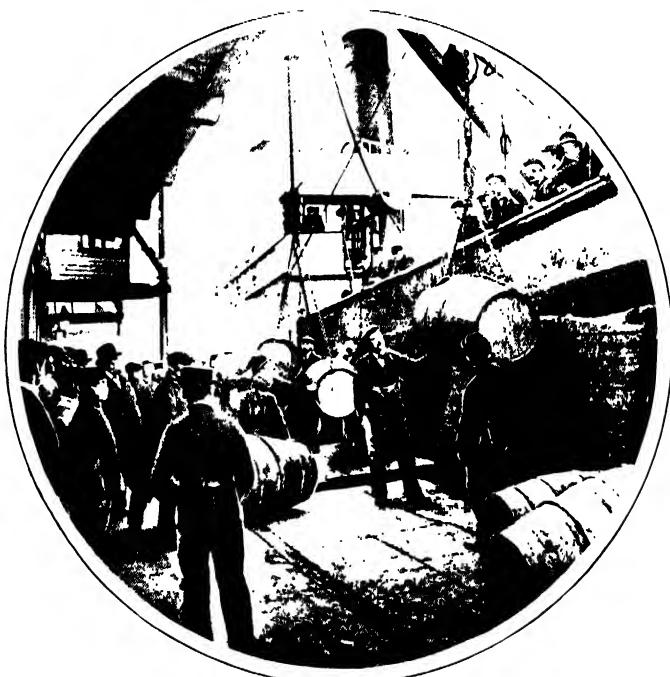
**Rigging
the
Derricks** of cargo are weighed and brought to the level of the deck.

But another derrick is being rigged in the same fashion, this time it is so guyed that it rakes outboard to lighter or wharf ; and the actual gear is ready to all intents and purposes, for as the spars went aloft four-inch rope-falls or wires were rove in the gins, and overhauled down to the deck. In one end of each fall a strong hook is spliced fast ; the other end is whipped with twine to prevent its unravelling. Now the hatches fly off, a dozen men jump on to the surface cargo, lay slings of spliced rope these have been prepared beforehand by the crew on the merchandise, and begin to pack cases methodically on the doubled rope. When the sling has reached a suitable size the two ends of the rope are brought up on top, one end is rove through the other, the hook of the fall is passed through the bight, and the fall is led to a winch-drum. Heave ! cries the hatch-foreman, the sling of cargo ascends, the foreman deftly swings

the hook of the outboard fall, the winch-man who handles this rope draws in the slack, catches a turn round another winch-barrel, the first one slacks whilst the second heaves, and a ton or more of

cargo is swung neatly over the side into the hands that are waiting to receive it.

And this simple operation goes on until the ship is empty to her skin. There is a ceaseless clatter of winches, cries of " Look out, below ! " as empty slings are flung down to the workers ; shouts from the watching officers who are tallying the output to see that it corresponds with the manifests and bills of lading, a general air of bustle. The decks grow littered with refuse, dunnage-wood that have been wedges between cases to prevent them surging in a seaway ; fibre mats that have been used to protect the precious packages from the bare and possibly sweating iron, worn slings, spare hooks, endless trifles. But always the winches chirp and swing the cases clear, always the hatch foreman walks to and



"Heave ! " cries the hatch foreman, and a load of cargo is swung neatly over the side.

fro from hatch to gangway, first seeing the sling of cargo clear of the hold, then watching that it clears the side outboard and is duly received by those paid to receive it.

So it goes on until the light and easily handled cargo is all ashore, but as the case we are studying is that of an average tramp steamer, lying, say, at a River Plate port it may well be that she carries in her capacious holds a thousand tons or more of railway material— harsh, unkindly stuff to handle, this, the kind that some-

The Cost in Human Life times costs human life in its unloading. There are a dozen thirty-ton boilers.

These must be handled with every precaution. The ordinary derrick and gear might at a pinch stand the strain of five tons; but something must be rigged that will lift thirty, and still leave a certain amount of precautionary overplus. And because the ship's owners are responsible for any loss of life that takes place aboard her, it behoves the ship's officers to oversee the rigging of everything themselves. Because sailors are very like ordinary human beings, and prefer to trust to their own handiwork in preference to leaving the matter to other hands, the officers muster the crew and set about sending up stronger tackle. A huge spar has been carried expressly for this purpose. It is lying on the deck ; it must be rigged at once.

A vast fourfold purchase block is securely lashed to its upper end ; turn on turn of three-inch rope is used for this, and each knotted end is carefully stopped back with spunyarn that there shall be no slipping. Guy tackles, very much stronger than those used on the derricks, are also lashed in place, and a giant block, the mate of one that has been lashed to the spar, is hauled aloft, and there fastened to the mast-head by means of rope. Nothing is left to steel ; the old fondness for good grass rope, that will give due warning of any impending breakage, still holds in sailors' hearts. Through the sheaves of the two blocks a six-inch hauling-line is rove to form a fourfold tackle, and one part of the work is done.

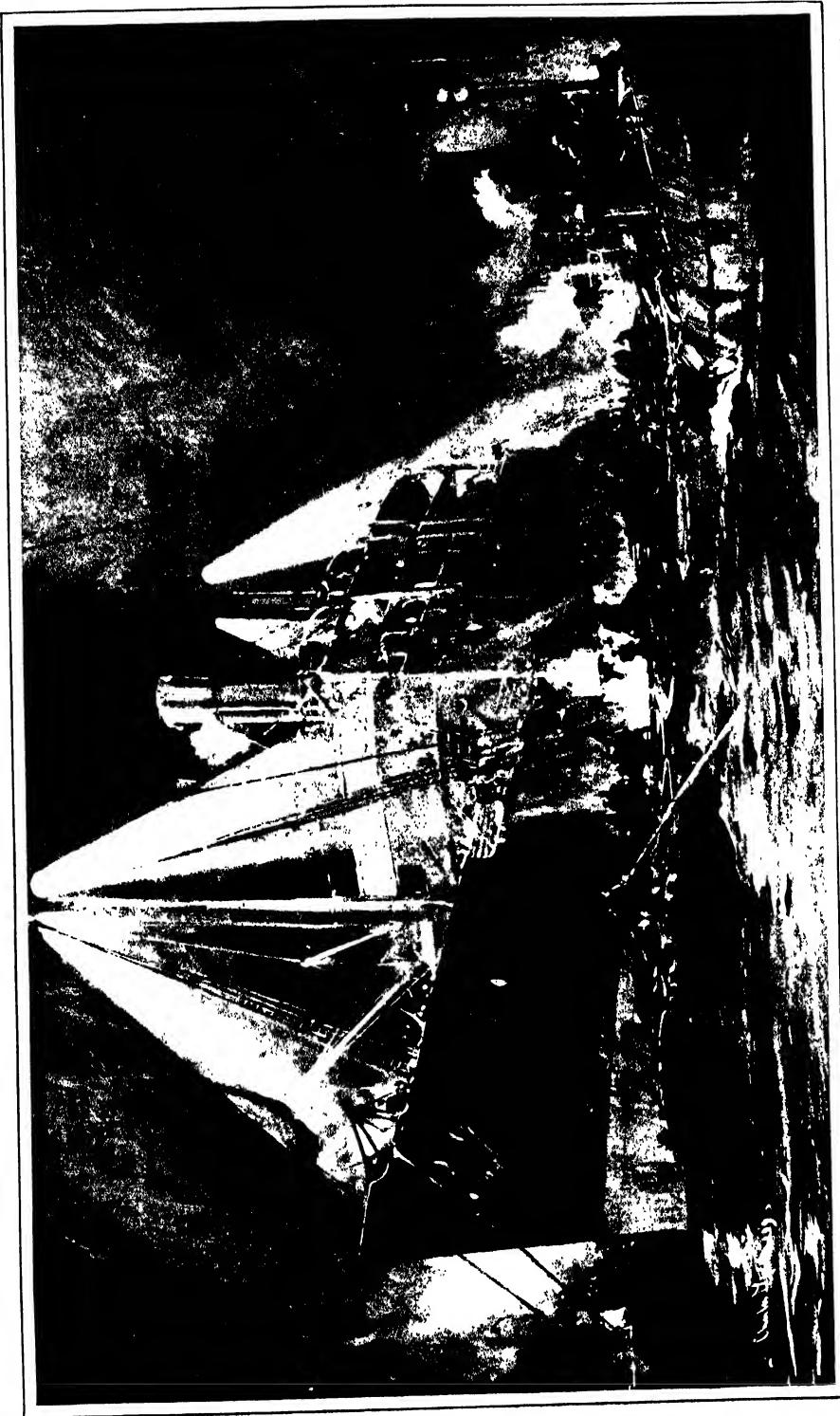
Another purchase block, equal in size to the others, is now lashed below the span-tackle that leads to the mast-head, and

another six inch rope is rove through this block and a companion block lying on the deck to form a lifting tackle. The result is that the spar is secured to the mast-head by five, six, or seven thicknesses of six-inch rope, whilst the same amount of cordage is hanging in another tackle for lifting the weight below. Well and good. The mast-head tackle fall is led to a winch, the slack is taken in, and then, carefully tended by willing men, the cumbersome affair begins to lift from the deck. Men stand by the thick heel of the great derrick, and gently burge it to rest in a vast wooden shoe that has been hollowed out to receive it, this shoe serving a double purpose, as it prevents the heel from slipping and saves the deck from damage at the same time. Chains are lashed from this heel to the mast, the guys are hauled taut, and the tackle is ready. The lower block of the lifting tackle is fitted with a monstrous hook, and this hook is carried below to the selected lift and there securely lashed in such a manner that when a strain comes on the tackle the weight will be fairly balanced. Of course it may happen that the stevedores at the port of departure have been compelled to stow the boiler away in a corner, for the sake of room, and first of all the great thing has to be dragged cautiously out into the open space below the hatch.

But when the hook is lashed in its place, and enough good new rope is used for this purpose to break the heart of an economical mate, the real work begins. Men are stationed at every coign of vantage to carry an order, for a single moment's hesitation may spell disaster.

An Anxious Time

The six inch fall of the lifting tackle is led to the stoutest winch on board, or, if the winch be not strong enough, to the windlass on the fo'castle-head ; the word is given to heave with caution, and the ropes creak and strain awesomely. The six inch line thins as the strain is put upon it, unaccustomed watchers would hold their breath, thinking that mere grass could never stand such an



Darkness comes down, but the work does not cease. All through the night the clamour goes on, the cargo leaping like mad from the hold.

awful strain; but levers are being used judiciously below, a shove here and a pull there work wonders; little by little the thirty tons are lifted from their resting-place, and slide out with a rush to the hatch. Here the boiler is let rest for a while whilst the lashings and every inch of gear are overhauled carefully, lest there should have been sags and chafes which might cause the ropes to part when the boiler is hanging suspended in mid-air, which would end in the weight dropping clean through the ship's bottom and taking the ship after it.

Presently the weight is suspended above the hatch. The tackle is now block and block—that is, the two blocks are jammed close together, and yet the boiler will not clear the rails. So the span-tackle is now led to a winch, and derrick, tackles and boiler all smoothly ascend into the air until there is sufficient clearance between the bottom of the lift and the bulwarks to ensure safe delivery. It is now a question of the guy tackles. These are slackened and hauled as the case requires until the great spar is hanging widely overside above a waiting lighter, the two tackles are slackened away, the boiler is received into its lighter or on to its truck, and the lift is safely over. A few bald words cannot do justice to the general air of suppressed excitement that prevails during transit, but be sure the mate breathes freely only when the tackles are slackened off and the lashings unbound.

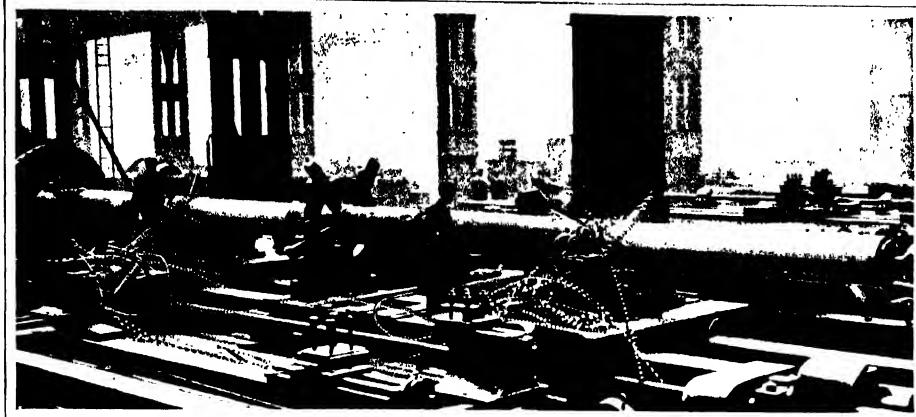
Various kinds of cargo call for different methods of working. Here in one hold is railway material—rails, fish plates and cases of bolts, things which are not worth the looting, and which are sure to tally correctly with the manifests. Therefore these are left solely in the hands of the stevedores, but here again is a hold full of precious merchandise—valuable stuff,

spirits, wines, "notions," as the Yankees call general cargo. Down this hatch an officer is constantly on guard to prevent pilfering, for your stevedore is not always blameless, and I have seen men in Sydney go down into a hold cold sober, but be raving drunk after an hour has passed. And yet there is not a single case of spirits broached on the surface. For your wily stevedore has a simple habit of taking up a promising box and slinging it down with all his force, with the natural result that every bottle within is shattered, and a steady trickle of potent whiskey runs from one corner. Then it is only natural that a thirsty man should take the gifts of the gods, and lift the dripping case to his parched mouth. The officers are below to prevent this.

Darkness comes down, but the work does not cease. Huge mushrooms of electric or imperial lights are ranged over the hatches, making the scene like day, and all through the night the clamour goes on, the cargo leaping like mad from hold to warehouse, until the bottom skin is reached; and then the crew appear on the scene with brooms and shovels, tidying up the refuse left behind, washing the holds down with hose and broom if necessary, getting everything ready for another freight. The carpenter happens along, and prises up the bottom boards over the limbers, crawls down and makes a careful examination of the many chambers, bales out dirty water and dips out clogging filth which might hamper the pumps in case of need, draws the attention of an officer to what he has done and receives his approval, replaces the boards, and the ship is safely discharged and ready for whatever fate and her charterers may be pleased to send her in the way of a homeward cargo.

FRANK H. SHAW.





P. P. News Photo.

A giant lathe turning an "A" tube for a 12-inch gun. The spiral turning lying in front of the lathe measures 188 feet in one piece.

Modern Weapons



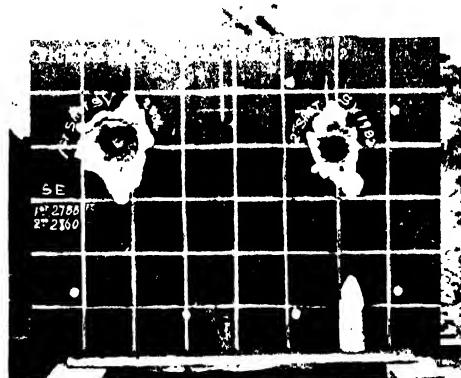
A shell fitted with an armour-piercing cap.

Before we consider the modern weapon it may be interesting to glance for a moment at those of the time when the Island Nation was beginning to make itself felt as a sea power. When Elizabeth

THERE can be little doubt that Britain owes her sea victories from the time of Elizabeth onwards to the recognition of the fact that excellence in gunnery is of the first importance to a navy. Most navies in pre-Elizabethan days

were regarded merely as floating parade grounds or a method of carrying military units, but after those

of Queen Bess the gun, or "cannon," as they called it, was given first place. The crew of the ship fought the guns, and the military were, to a great extent, ignored.



An armour plate used for testing shells. The right-hand hole was made by a shell with an armour-piercing cap, and the left-hand dent by an uncapped shell.

needs. The favourite was a heavy muzzle-loading, long gun of brass or iron, which threw a smooth, round, cast-iron ball to a distance of about a mile. It could be fired once every six minutes. Nelson's best gun could not do so very much better than this, though doubtless it was more accurate. Elizabethan war-

"Cannon" ships were also armed
of
Long Ago with a short-range gun for close fighting, and a breech loading

quickfiring weapon, that was mounted in the fighting tops and could be fired about thirty times an hour. A dangerous weapon this! It more often than not blew out its wooden breech block and killed its firers. Thus we find, even so early in our naval history, a specialised series of armaments each designed for particular work: the long guns for engaging at a distance; shorter, handier weapons for close range work, and quickfirers for beating off boat attacks and for firing upon the decks of an enemy's ship close at hand.

Although the modern gun is different in almost every way from those of Elizabeth's time, we still have these three types of armament on all our battleships, except those of the "Dreadnought" and improved "Dreadnought" types. There is, first, the main armament, composed of "long" guns of immense power capable of propelling a huge projectile to a distance of twenty miles. Next comes the secondary armament of smaller lighter guns for use against small craft, such as "destroyers," etc., in attacking which it would be uneconomical to use the larger weapons; they will carry from six to sixteen miles and are "quickfirers." The tertiary armament consists of small, very rapid-firing weapons for use against torpedo craft. The secondary and tertiary armaments show a great tendency to overlap in the types of weapon used, for it is thought by many that the very light machine-guns, etc., would be of little or no use against the modern torpedo boat, and that, having regard to the increased effective range of the

torpedo, it may be necessary in the future to use against them either 4.7-in. quick-firing guns, or guns of even larger calibre.

It is proposed to take these armaments one by one and examine the various classes of gun included in them, finding out how they are mounted and what means are used to protect their crews from hostile fire, and keep them well supplied with ammunition to do their deadly work.

The gun which is generally considered to be most effective in naval gunnery at present is the twelve-inch—that is to say, having a barrel the internal diameter of which is twelve inches. These guns have barrels from forty-five to fifty times as long as the internal diameter, or, as they say in the navy, they are from forty-five to fifty calibres. The truly terrific power of such a weapon may be judged from the fact that one of the *Bellerophon*'s guns mounted on the North Downs, near Redhill, could knock to pieces the General Post Office, twenty miles away, with three or four shells. Our "all-big-gun" battleships and battleship cruisers are armed with the twelve-inch gun.

We have a method of constructing these huge weapons that is peculiarly our own. It is known as the "wire wound" system, and by the courtesy of Messrs. Vickers, Sons and Maxim, the great gun-making and ship-building firm, we are enabled to give a very complete account of the whole process.

The first step is the casting of an ingot in an octagonal mould. The chemist has discovered that

**Making
a
Big Gun**

in such an ingot the impurities gather at the head, and accordingly the head of the ingot is removed. Then the centre of the great mass of metal, fifteen feet or more in length, is cut away to give it a tubular form. The ingot is next forged under an hydraulic press which is capable of exerting a pressure of ten thousand tons. When it leaves the press it is

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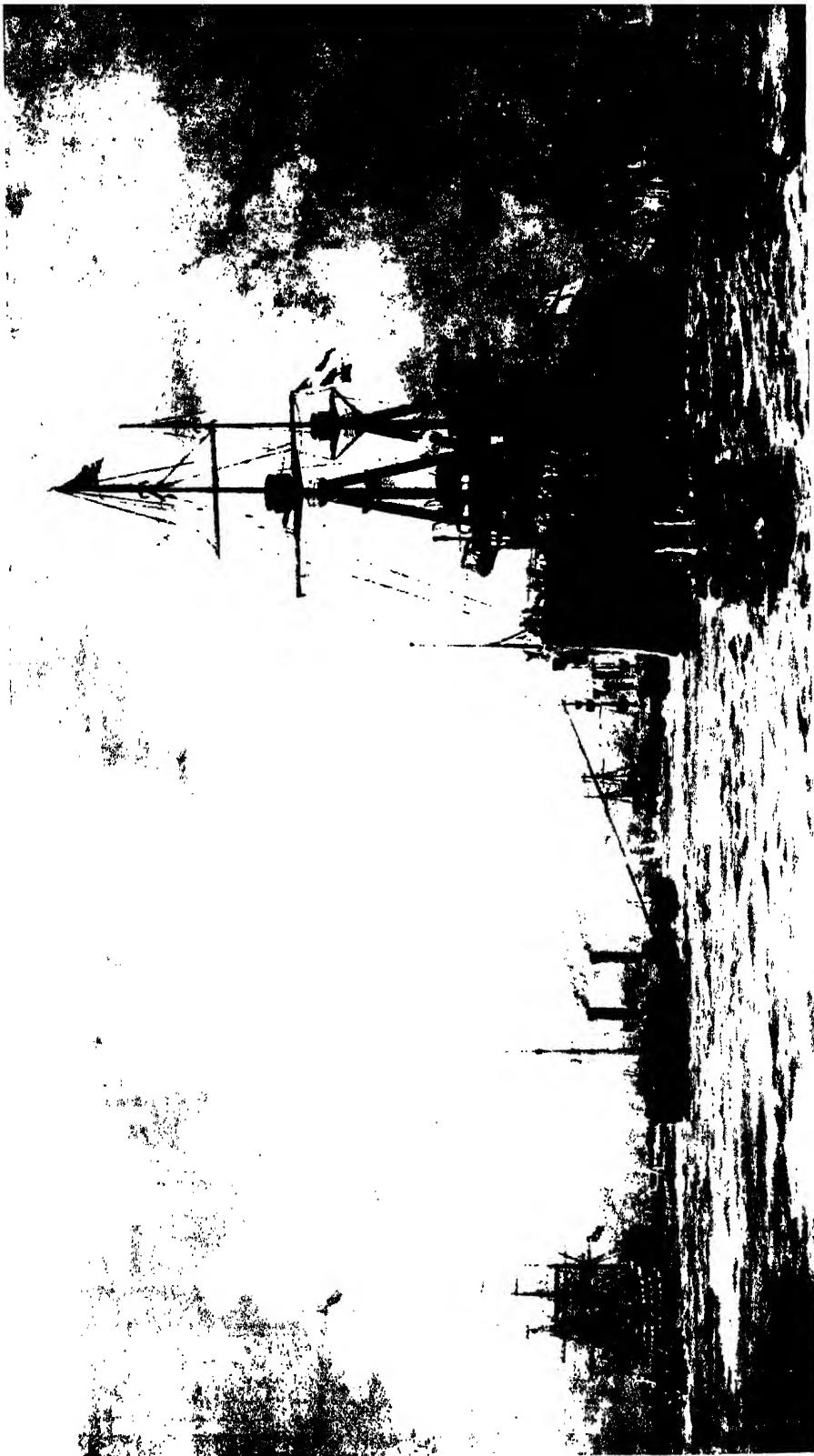
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NAVY CUT TOBA

H.M.S. BELLEROPHON.

Courtesy of the original painting by W. L. Wyllie, R.A.



THE SEA AND ITS STORY



EDITED BY
CAPT FRANK H. SHAW
AND ERNEST H. ROBINSON

CASSELL AND COMPANY, LIMITED,
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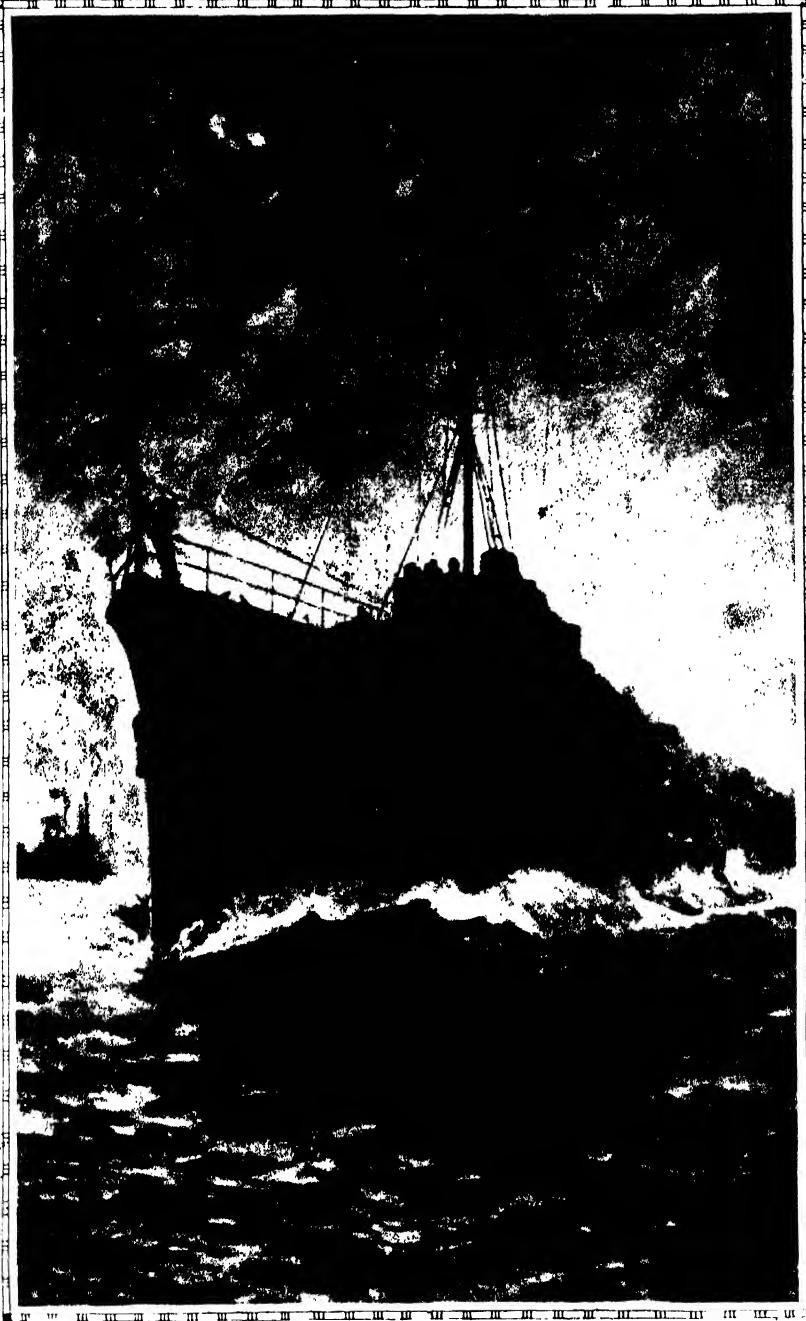
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THE SEA KING'S CHILD.

One of Britain's latest "Scouts" at full speed.

From a Painting by Cecil King

roughly of the right dimensions for an inner tube, or "A" tube, as it is called.

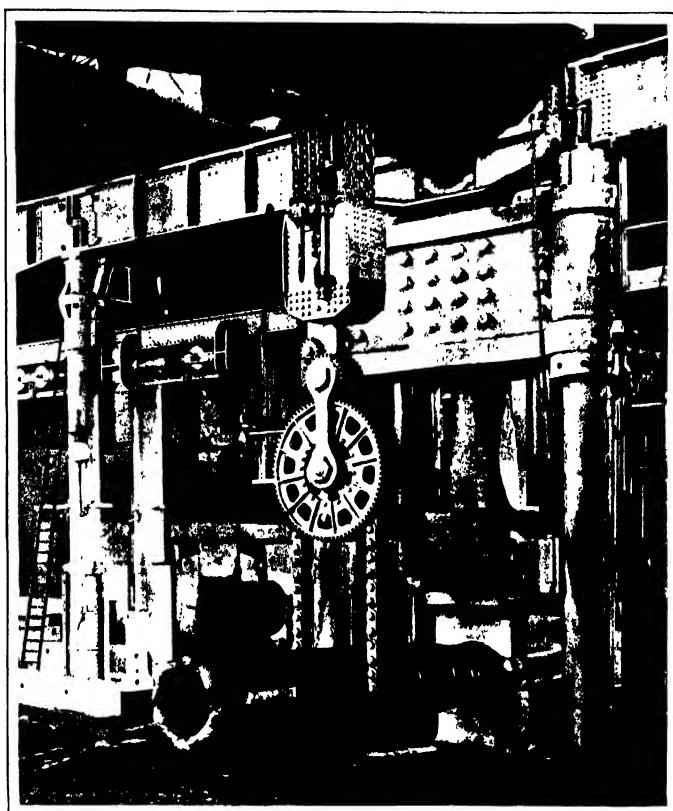
The forging is now rough turned and bored, and then tempered, or hardened, in a bath of oil. At Messrs. Vickers' Sheffield works the tubes are lowered into an oil well by a giant crane known as the "Goliath," which is capable of handling the longest and heaviest guns made. After the tempering has been finished pieces are cut from each end of the various tubes and are tested to see if the work is so far satisfactory.

Now comes the wire winding, one of the most interesting processes in connection with the manufacture of modern guns. Round the tube there is wound steel ribbon about a quarter of an inch wide and one-sixteenth of an inch thick. The ends of the ribbon, or tape, having first been secured to the tube at the muzzle

end by being wedged into a small recess, the gun is rotated and the wire ribbon wound upon it at high tension in one continuous close layer from muzzle to breech and back again until the required amount has been wound upon the tubes. It is then skimmed over in the lathe again and is removed to its old friend the Goliath crane, where the external jackets are placed on over the layers of wire.

All modern guns are, of course, breech-loading, the breech being closed by suitable screws or blocks, arranged so that they can be swung out of position to allow the shell and the charge to be

inserted. These breech blocks have to be very carefully constructed to withstand the enormous strain of the explo-



A 10,000-ton hydraulic press forging a 12-inch gun jacket.

sion. The block is swung on hinges like a door, and is so arranged that the rotation of the operating handle will first of all unlock the block, and then swing it clear so that the bore is ready for the insertion of another shell and charge. The block really screws into the rear of the chamber, the front of the block being provided with an obturating pad which makes it absolutely gastight. The screw is cut across its pitch, or "interrupted," so that one-twelfth of a turn has the effect of screwing the breech piece right home, or, when reversed, of disengaging the screw along its whole length.

So cleverly is the breech piece arranged

in every way that it is possible to load a twelve-inch gun with its 350 lb. of cordite and its 850-lb. shell, fire it, open the breech and fire the charge again twice in one minute.

The accuracy of these great guns is so fine, and the training of the men

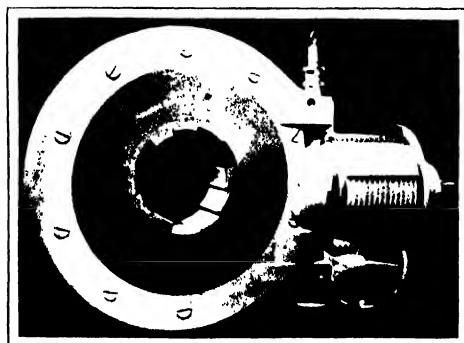


Photo: Pickers, Sons & Maxim, Ltd.

The breech mechanism of a 12-inch gun fully open. Note the interrupted screw for quick opening.

who work them so good, that the average for the whole British Fleet is about one hit in two minutes. The average of the best dozen ships gives about one hit per gun per minute.

We hear a great deal about the short life of these big guns, but nowadays a great deal has been done, by improved construction and advancing knowledge of the powder used, to very much increase the number of rounds that can be fired. As most folk know, the interior of the bore is rifled—that is to say, it has spiral grooves cut in it throughout its entire length. Copper "driving" rings are fitted to the shells, and the power of the explosion forces these to bite into the rifling grooves, preventing the escape of the propelling gases and giving the projectile the twist that keeps it steady during its flight.

The terrific energy generated by the explosion of the cordite charge in the twelve-inch gun may be gauged by the fact that the projectile leaves the muzzle of the Mark XI weapon at the rate of 2,900 feet per second, and

it has been calculated that could the energy so used be translated into lifting power it would suffice to hoist a battleship of the improved "Dreadnaught" class two and a half feet into the air. Now, such a great generation of force within a confined space is bound to have a wearing effect, and, as a matter of fact, the "wash" of the rapidly moving white-hot gas tends to smooth out the rifling. Well-fitting "gas-checks" and driving bands on the shells tend to minimise this wear by "wash." The accuracy of the gun suffers in the end, and the only thing for it is to reline the bore. The latest method of cleaning the bore of the gun after each shot is by means of the "automatic air blast," which is fitted to the breech block and comes into action automatically as soon as the breech commences to open.

The sighting arrangements of all big guns is telescopic that is to say, one or more large telescopes are suitably fixed in convenient positions with respect to the gun and its mounting, and when looking through these telescopes cross wires will be seen, the idea of this being that when the gun is manœuvred into

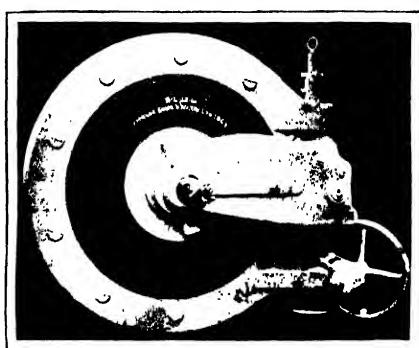


Photo: Pickers, Sons & Maxim, Ltd.
The breech of a 12-inch gun closed and ready for firing.

such a position that these cross wires appear immediately over the object aimed at, then the gun is in the correct position for firing. This sighting gear is generally in the charge of a petty officer

Testing a 12-inch naval gun. This wonderful photograph shows, not the smoke as might be supposed, but the actual flash of the explosion of smokeless powder.



or first-class gunner, the range of the object aimed at being communicated from the fire-control station to the sight setter, whose duty is to set the sight. The firing of most modern guns is by electricity, a pistol or firing key being placed on the gun mounting, so that as soon as the gun layer (who sights the object through the telescope) has his sight on the object, he may complete the electric circuit by means of the "firing key." As he does so the electric current

are not sufficiently diversified in main principles to need separate description, but it must be remembered that the best of them are much inferior to the twelve-inch gun fitted on the ships of our improved "Dreadnought" class, which leads the world to-day.

Before we discuss in detail the mounting of the main armament it will be well to understand clearly the real difference between the terms "turret" and "barbette," some confusion having arisen—

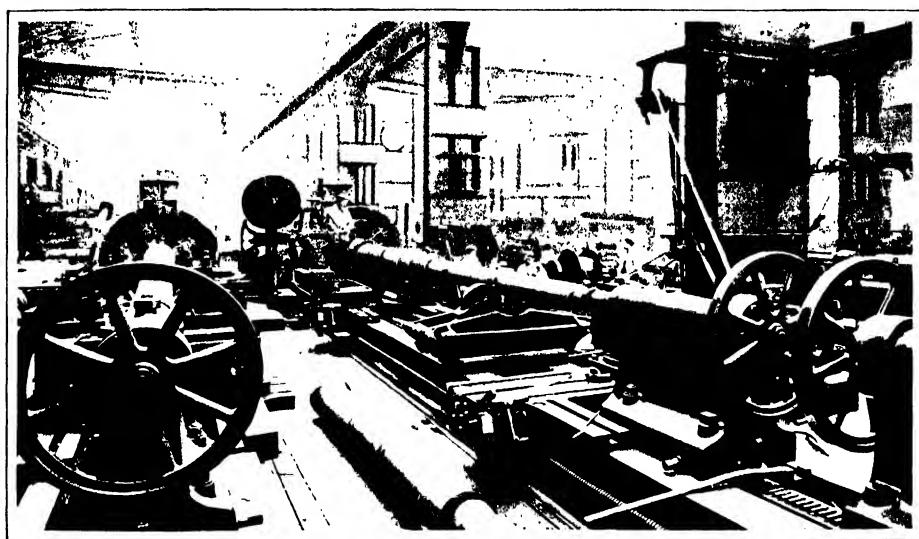


Photo: Underwood & Underwood.
Winding the wire into a 12-inch gun by means of a huge lathe.

passes through the former and fires the main cordite charge. The time occupied by this electrical method of firing is so slight as to be, practically speaking, instantaneous.

Of course, the cost of these guns is great. About ten thousand pounds would be the cost of one twelve-inch weapon, and a British "Dreadnought" carries ten of them. The cost of firing comes out at about one hundred pounds for each shell and charge. These are only approximate, but they are near enough to show how terribly costly a thing, in money only, would be a naval war in these days.

The smaller guns of the main armament—the ten inch and 9.2 in. weapons—

quite unavoidable—in the public mind by the use of the former term to cover all modern big-gun mountings. The turret, then, is a squat, circular structure of heavy armour, pierced for the protrusion of the gun-muzzles. It revolves upon steel rails upon the deck, the guns revolving with it. The barbette is also a tube of thick armour, but it is built into the ship itself and is immovable. It protects a turn-table which carries the guns, usually two to each barbette.

Ammunition is brought up to the guns from the magazines deep down below the water line by a system of lifts or hoists which are protected by armour. In old-pattern gun-mountings big guns could

only be loaded in one position, and had to be brought back to that position after every shot. Nowadays, however, the ingenuity of the engineer has overcome this difficulty, and the rammer can receive shell and charge and thrust them into the chamber in any position, thus getting away from the necessity of having to lay the gun afresh after every shot. The moving of the guns and barbette shield, which together weigh nearly five hundred tons, is performed either by electricity or hydraulic power, though in case of necessity all the manœuvring can be done by hand. The elevation hoists are usually moved by electricity, though they also are pro-

vided with hand gear for use in case of emergency. Various kinds of projectiles are provided for various purposes, and

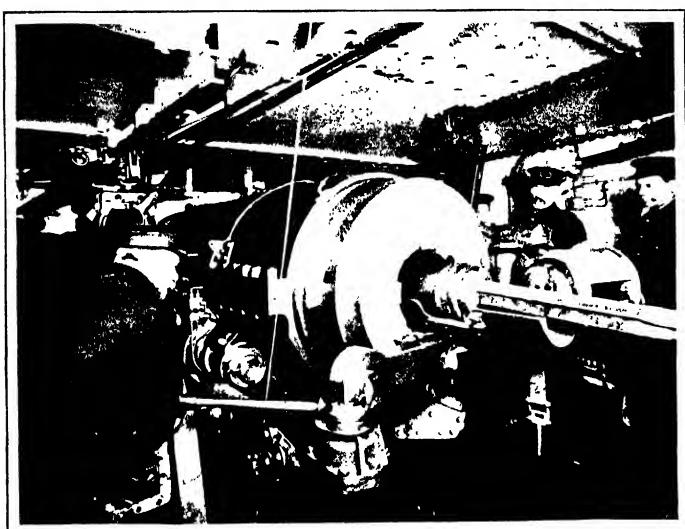
to facilitate recognition they are painted with different coloured rings. A red ring near the point, for example, always denotes that the shell is loaded and a yellow band round the body indicates a practice and not a war shot.

With the exception of the lyddite shells, which are painted yellow, nearly all the projectiles are painted black.

Nothing has yet been said in this article about the enormous force of recoil of the guns of the main armament. When the projectile leaves the gun it travels about a mile in the first two seconds of its flight, and it is obvious that to get up so terrific a speed it must exert powerful reaction as it rushes along the rifled bore and leaves the muzzle. To withstand this and the burst of the escaping gases as the shell leaves



Practising loading a 6-inch gun with a dummy breech. Loading is carried out against time, and records are eagerly sought.



Printed by Fraser, Sons & Maxim, Ltd.

This view of the interior of a battleship's barbette shows the hydraulic ram pushing a shell home into the open breech of a 12-inch gun.

the gun the muzzle is thickened and the kick or recoil itself is taken up and neutralised by an ingenious arrangement of

the gun the muzzle is thickened and the kick or recoil itself is taken up and neutralised by an ingenious arrangement of

hydraulic buffers. The most modern gun mountings are fitted with a "counter-recoil," whereby the weapon is run out again into the firing position directly the recoil is absorbed. It may here be mentioned that the old method of mounting the guns on the trunnions formed on the body of the gun is now obsolete, and that the trunnions round which the weapon is elevated are formed on a suitable cradle, which is arranged so as to keep the gun in alignment during the time it recoils and is returned to firing position.

The penetration of the projectile fired by the guns of the main armament is enormous. At 5,000 yards the most modern twelve-inch gun will pierce nineteen

Though most of our battleships and armoured cruisers are provided with a secondary armament, the invention of the "all-big-gun" ship has rendered this class of armament obsolescent.

The six-inch gun is remarkably handy. It is fitted with a curved shoulder-piece against which the firer leans whilst he controls the movement of the gun. The accuracy and rapidity of fire obtained is really marvellous. The guns of the secondary armament are usually mounted in small casemates, or gun-houses, arranged along the sides of the ship, though in some of our armoured cruisers a pair of six-inch guns are mounted in a turret forward.

Now, as to the tertiary armament. These anti-torpedo craft guns are carried by all ships of the navy, in some form or other, from a "Dreadnought" to the smallest motor-vedette.

Their use is to make round a battleship or other vessel such a zone of danger that a torpedo craft could not possibly get near enough to launch one of her deadly engines of destruction with any accuracy of aim.

At the present time it may be taken for granted that

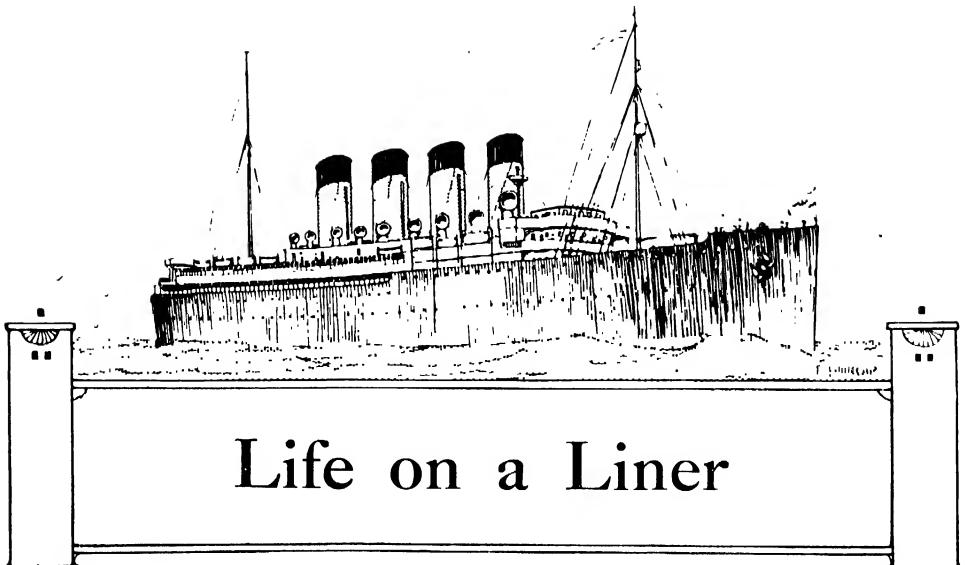


One side of a barbette on H.M.S. *Cæsar*, showing the closed breech and gun crew at work.

teen inches of Krupp cemented armour with an armour-piercing shell. The thickest armour placed on any battleship is twelve inches. At the same distance the ten-inch gun will penetrate eleven and a-half inches and the 9.2 weapon can get through ten inches.

we have for the arming of our navy weapons and propellants of such precision that the men, though they are without doubt the best gunners in the world, cannot utilise, save under exceptional circumstances, their full capabilities.

ERNEST H. ROBINSON.



Life on a Liner

TO the untravelled Briton, who has only seen the sea from the firm security of a sea resort's promenade, life afloat presents a kind of unsolved problem; it is girt in mystery, is full of suggestions of high romance. To the man who uses the sea as a means of securing a livelihood, life at sea is an unending monotony, perhaps, a continued sameness comprised in the main of duties that seldom alter, of meals that grow unpalatable, of arduous conditions. And when the actual fashion of life afloat comes to be inquired into it is probable that it will strike the detached observer as a happy medium between two extremes.

Modern science, the catering for bodily comfort and mental ease, the fastidious delight taken by many in the overcoming of such incidentals as at one time seemed inseparable from ocean voyaging, have gone far to make life on a liner delightful. The one uncontrollable force in the scale of ease is the weather; and even that, whilst remaining unbridled, has been foiled to a great extent of its power to cause discomfort. It was found that a small ship was tossed hither and thither

mercilessly at the will of the roaring waves; bigger ships have been built therefore, and these, on account of their size and weight, offer increased stability. The demon of sea-sickness, if not exorcised, is at



The Board of Trade Inspector going over the captain's chart before the liner starts.

least enthralled considerably ; and ocean voyaging has, within the past decade, lost more than half its terrors.

The actual conditions of life depend, of course, to some extent on the kind of business in which the liner is engaged. A vessel journeying to the radiant East has the prospects of a lengthy trip and fine weather ; and due regard is had to these circumstances. On an Atlantic liner, again, the voyage is necessarily short, and really fine weather is seldom encountered for two consecutive days. But since the Atlantic presents the widest contrasts, it may be as well to study the mode of existence during the five, six, or seven days' dash from port to port.

The captain and officers come first under observation. They are a little community apart from the thronging

commonplaces of everyday existence. But from the passenger's view-point they are enigmas. Your Atlantic traveller sees uniformed men pacing steadily across a spidery erection far above the saloon deck ; hears an occasional command uttered in a voice but little above normal speaking voice, hears the occasional ring of a telephone bell, and wonders what these men of the blue cloth and gold braid do to earn their pay. They seem mere figure-heads, dolls dressed up and placed aloft for show. They are anything but that. Those seemingly indifferent men are the eyes and brains of the ship ; and each one of them, from junior up to senior, is a skilled scientific sailor, knowing all that can well be known about the vagaries of weather, the management of a ship, the controlling of men.

The youngest officer of all is a qualified master mariner, holding, in all likelihood, an extra certificate of competency. And each of these men has his duties outlined for him in no hazy terms. These officers have their orbits in which they move almost with the regularity of a planet. Come calm or storm, they take their positions on the bridge at specified hours, they maintain a steady



Photo: C. & E. Hyatt.

Before a liner puts to sea the stores are all examined by the Board of Trade Inspectors.

passengers ; they have their own tastes, their own recreations, their own accommodation. They, by reason of long custom, are apt to look somewhat cynically on the outspoken awe of the casual passenger ; things that loom gigantic to the untravelled mind are to them the

fast look out ahead to see that the sea-road is clear of obstructions ; they keep eyes on the course steered, that no unseemly deviations may be made ; they cast occasional glances astern to the saloon decks, to see that the passengers are happily employed ; and if their

eyes tell them that there is a lack of verve or zest in the daily pleasures they speak a poignant word to some subordinate, and almost as if by magic

toddling infant. Socially he is a gigantic success, officially he is even a greater success; for the passenger sees only one side of his life; and that the pleasantest.

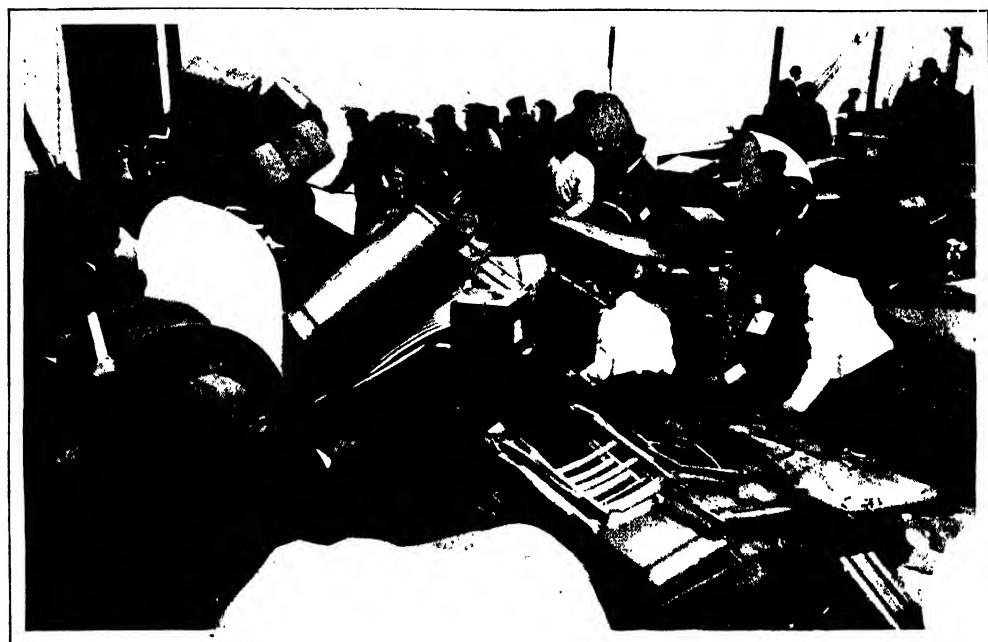


Photo: Clarke-Hynes.

Sailing day on an Orient liner. The rush of baggage from the tender to the ship.

materials for enjoyment are spread out before the listless voyagers.

Chief amongst the officers is the captain. His daily life seems to be a holiday; he moves at large amongst his guests, always ready to answer the most alarming question; ready to amuse a fractious child, or to hear confidences from an aged mother, who has not seen a missing son for years. Withal he is ready to laugh with the youngest girl on board, and to cap the wildest smoking-room story with a wilder; he is in short a man of parts, possessed of a good education, and the polished *savoir faire* of a man of the world; jealous for the honour of the company he serves, anxious that his own ship shall secure a reputation as being the most homely on the route; the friend of the nerve-wrung American millionaire as he is the friend of the

The liner's captain is the thought centre of its brain; he must cope with such emergencies as arise, and he is the court of final appeal. He possesses a wide jurisdiction, though it is seldom exercised to its full limits. He can, if discipline demands it, order the imprisonment of the most influential saloon passenger aboard; he is the man who knows a little sooner than anyone else when there are undesirables in the saloon, and it is on his authority that the notices are posted up on the green telegram board of the smoking-room, telling all who may be interested that known swindlers are aboard, the notice warning all careless people that if they are inveigled into card games with chance-met acquaintances the risk is their own.

But a captain's life consists of more than this. He trusts his officers to

The Sea and its Story

maintain the ship's even course ; but he sets the seal on their work every day when he ascends to the bridge at eight o'clock and noon to take the observations that shall assure him of his charge's exact position. He has charge of the charts ; he knows every slightest danger that may be apprehended ; he forewarns his sub-

The Captain's Watching Eye

ordinates, and bids them keep an eye to possible contingencies ; and he, when the

thick fog-demon walks at large over the surface of the blinded sea, takes the reins into his own capable hands forthwith, and directs events until all danger is over and sunny skies once more shine. Some passengers complain that the captain is a most unapproachable man ; these passengers have probably crossed when the fogs have been most prevalent. It is no uncommon event for a liner captain to spend an entire voyage on the bridge eating there, ay, sleeping there in a deck chair, in instant readiness for any call. For hour after hour, for day after day, the captain keeps at his post, his bloodshot, weary eyes peering through the baffling fog his ears keenly alert for the slightest warning sound from an approaching vessel knowing full well that dangers of the most hideous are everywhere about him, dangers of derelicts, of icebergs, of sailing vessels with unsatisfactory fog-horns, and knowing, over and above the fact of these perils, that he alone is actually responsible to his owners, his underwriters, and his God for the well-being of a ship worth a million, a cargo worth another, specie to a fabulous value, and three or four thousand human lives. This pulsating world of treasure he must take across a notoriously stormy sea in the least possible time ; or else--well, there can be no or else, for if the worst should come it means death for the captain. If not actual physical death, professional death—and that, to the sailor, is worse than the mere stopping of a heart's action.

So the life of a liner captain is on the

whole one of violent contrasts. From the moment when the great ship leaves her port to the moment when she ties up to her next berth his brain is always on the alert ; even when he is most entertaining, when he is surrounded by a bevy of interested passengers, to whom he is retailing marvellous stories of Neptune's domains, his subconscious mind is listening for the first sound of warning from above. Under normal conditions he leads the life of a polished gentleman ; he has his own apartments into which none may penetrate without express permission ; he has hobbies in which he may indulge ; he can isolate himself completely from his world ; or he can, and generally does for your true sailor is a gregarious animal when circumstances permit mingle with the throng and cunningly devises new means of passing the days that of necessity occasionally drag.

Under abnormal conditions he becomes endowed with strength and self-reliance almost superhuman. His brain rejects and accepts automatically ; it solves intricate problems in the time required for a single lightning flash ; he is one throbbing mass of nerves--a human telephone exchange, where the many wires of the ship's life converge and mingle into one marvellous whole. And, after a strain such as few men are called upon to endure--and which, mark you, our captain endures year in and year out—he throws off his captainhood with his fog-wet oilskins, and becomes again the urbane, smiling man of the world ; a little bloodshot and weary about the eyes, perhaps, but ever ready to assure those trembling women and nervous men that "all's well with the ship."

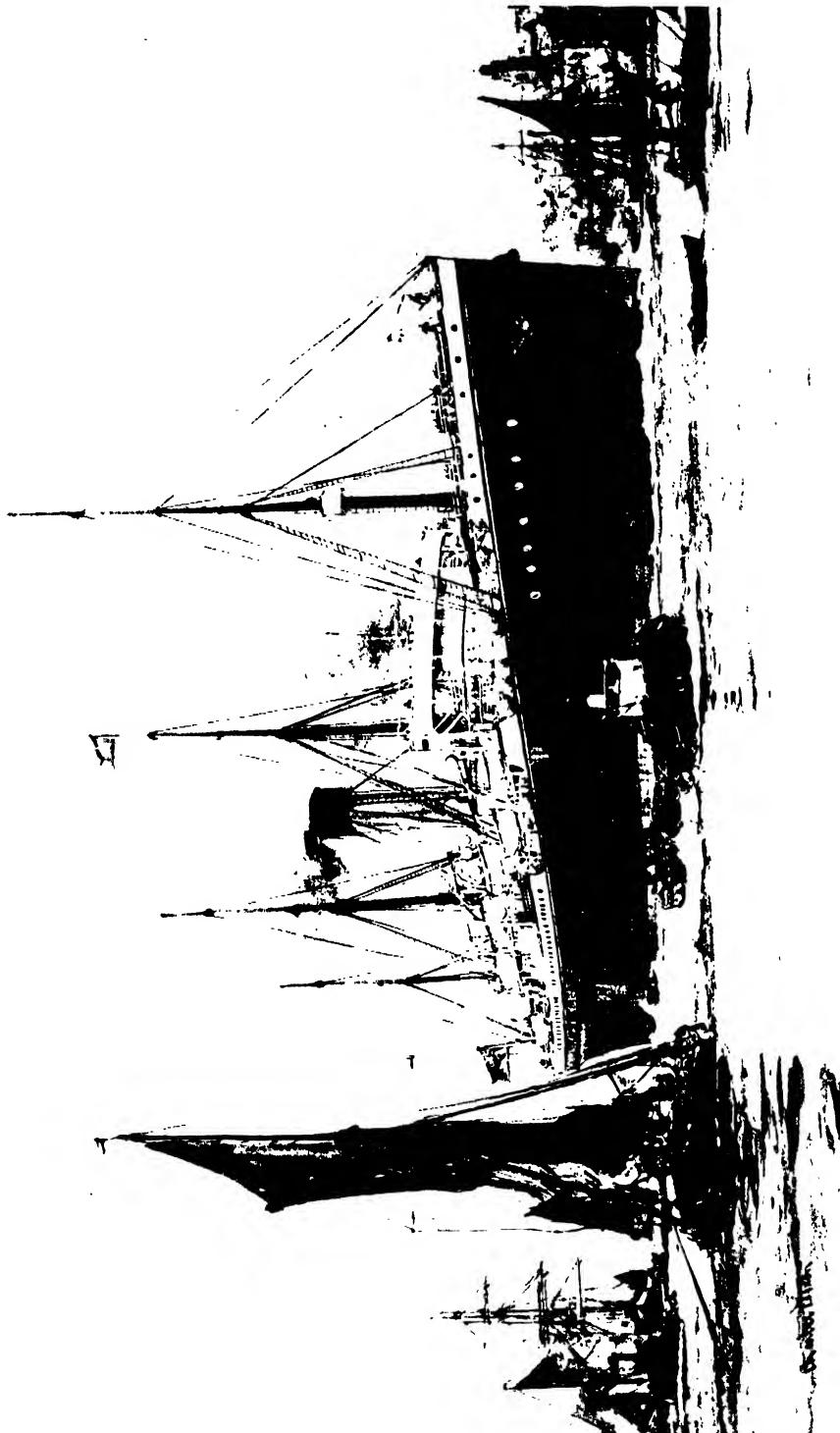
The Life of the Officers

The life of an officer is to some degree similar to that of his superior, without the mighty responsibility. The various grades of officialdom have their respective duties ; the chief officer is a sort of deputy commander—he keeps a regular watch, but some remnant of the com-

From the Collection of C. G. D. & J. L.

A White Star liner arriving in the Port of London laden with cargo and passengers from Australia and the Far East.

By permission of H. M. Stationery Office



mander's responsibility has fallen on to his shoulders ; he marks the dividing line between captain's room and officers' mess. To him the boatswain and the various petty officers are responsible for the seemliness of the ship for its cleanliness and smooth-working—as he, in his turn, is responsible to captain and owners. Regularly at four o'clock each morning the chief officer leaves his room, ascends the bridge, and keeps his steadfast watch, peering always through the driving snow or the howling gale for such signs as shall tell him the shipping of the world is in his track. He is for the time being answerable for his ship's safety, and that ship is travelling at some twenty-eight land miles per hour. Ahead of him shines a sudden bright light—a liner coming the opposite way. That other vessel is steaming at twenty-eight or more miles per hour ; that means the combined speed of the two ships is nearly equal to the speed of the fastest express train. It is a thick night maybe ; not foggy, but a thin deceptive rain is driving into the eyes of the watch. That rapidly flashing light may be only a bare mile away—only a minute remains in which to make up his mind ; the ordinary landsman, untrained to cope with sudden emergencies, secure in a well-sheltered, leisurely life, would not have had time to think of the subsequent horrors supposing a mistake were to be made ; but the chief officer breathes a word ; in the wheelhouse the steam wheel hisses a little ; the racing bow swerves grandly, and almost before it seems possible for

**Ships that
Pass in the
Night** that word to have reached the lips, the liner is broad away from her course, and

a glittering scintillation of lights is flashing past her beam within a biscuit toss.

"Night signals." From bridge and poop rockets and coloured lights flare ; the two proud giants have spoken their greeting ; all is well, but one minute's hesitation on the part of either of the

men on the bridges might have sent four thousand souls to a horrid death.

The chief officer resumes his silent-footed tramp from bridge-wing to compass, and chats pleasantly with the junior officer standing there intent on the vessel's course.

"Get her back." The ship swings into line, and the senior officer continues his chat ; it takes away from the sense

**Luxury—
and Chill
Discomfort**

of utter loneliness to have an intelligent junior near at hand. It is not a particularly arduous life, it is a well-fed life ; it has its moments of relaxation and ease ; down below is a warm and well-lighted cabin with luxurious settees and all the cosy niceties of a well-found home ; but see that life when the Atlantic is out to strike. Mark how the whirling blizzard drives down in yelling, anarchical fury ; mark how the giant Atlantic combers snatch up even that monstrous construction of steel and throw it hither and thither like a feather. And one man's brain must do its utmost to keep the fabric steadied, that the sleeping passengers may not taste too fully the discomforts of a life on the ocean wave. There is chill bitterness in the blizzard's breath ; the rails of the fore-deck are already solid with the ice of the driving sprays that burst over the pounding bow and freeze as they fall ; the deck itself is a glacier ; the rows of boats ranged along the rails are individual ice-hummocks ; and through that appalling smother of snow, hail, and storm—with men dropping at their posts from frost-bite, unprotected save by a flimsy weather cloth—the senior watch-officer must keep both eyes staring wide, both ears gaping, and every faculty on the alert to cope with the most unforeseen emergency.

So the small hours of the morning pass. Five o'clock sounds on the ship's bell, and the boatswain or his mate presents himself for orders ; the chief officer must detach himself for the nonce from one duty to turn his thoughts to another.

He knows there is a certain stretch of iron that stands sorely in need of paint—the rust is already showing. Dare he do it? Is it not feasible that, supposing he does order his men to smear the offending metal with preserving paint, some passenger will, in the sheep-like, inconsequent fashion passengers have,

storm and night come to the chief's assistance; he issues his orders; the work is either set afoot or abandoned for a more favourable opportunity; the boatswain tramps down the ladder; a quartermaster appears with coffee, and the strain of the night fades before the goodness of a growing day.



The luxury of a modern liner is well exemplified by this picture of a sunny afternoon in the Verandah Café of R.M.S. *Mauretania*.

rub his garments up against it and then clamour loudly for redress? A smear of paint in the wrong place may well mean a discontented passenger, a discontented passenger might mean two dozen dissatisfied intending passengers, and there you have the small trouble ranging indefinitely, like the ever-widening rings that rise to the surface of a silent pool to the touch of a carelessly-thrown pebble.

But the tact and skill that have piloted the resonant, pulsating mass through

As with the chief, so with the other senior officers. Each of the three watchkeepers has his four hours of strain and anxiety, his eight hours of calm and recreation. From four to eight in the morning, from four to eight in the evening the chief keeps ward; from eight to twelve the second officer keeps his vigil, from twelve to four the first officer maintains a steadfast look out; never a moment passes when the ship has not a capable man on her bridge, and generally there are two,

lest an indisposition should seize the senior, and leave the ship, for valuable minutes, unintended. Be sure they guard

server has hardly noticed it. But those four experts have caught the round limb of the sun in their mirrors, have dragged down the sextant arms, and have fixed the luminary's altitude decisively, so that the adding and subtracting of a few figures give them the ship's exact latitude for that moment. Then eight bells strikes, a fresh junior officer springs up the ladder to the bridge ; the course is given, the new ship's day has begun.

In addition to maintaining a steady look out on the course steered, and keeping a secondary look out, the junior officers have other duties. At stated intervals they patrol the entire length and breadth of the ship, seeking for fire, or for anything that shall in any wise appear like infringement of liner law.

Attended by a master-at-arms and a steward, the junior exhaustively surveys all corners where fire might lurk, sees that fire-appliances are ranged in order for emergency, cautions all watchmen to keep awake—sees that they are awake—and generally satisfies himself of the internal well-being of the ship.

Off duty the officers lead a communistic life in great measure, for on the Atlantic service passengers are not encouraged to fraternise with the official staff. They have their own quarters, and they are in the main sufficient to themselves ; but the companies guard their officers' morals well—they forbid the excessive use of liquors, the playing of cards, and everything else that may tend to sap away a man's integrity of soul and steadiness of nerve. But there is a snug little library for the officers' benefit ; they have their own little amusements ; they manage to



Passo F. F. and Co., Paris/for "Penta."

Out for his morning airing on R.M.S. *Lusitania*.

their possessions well on the stormy Atlantic ferry.

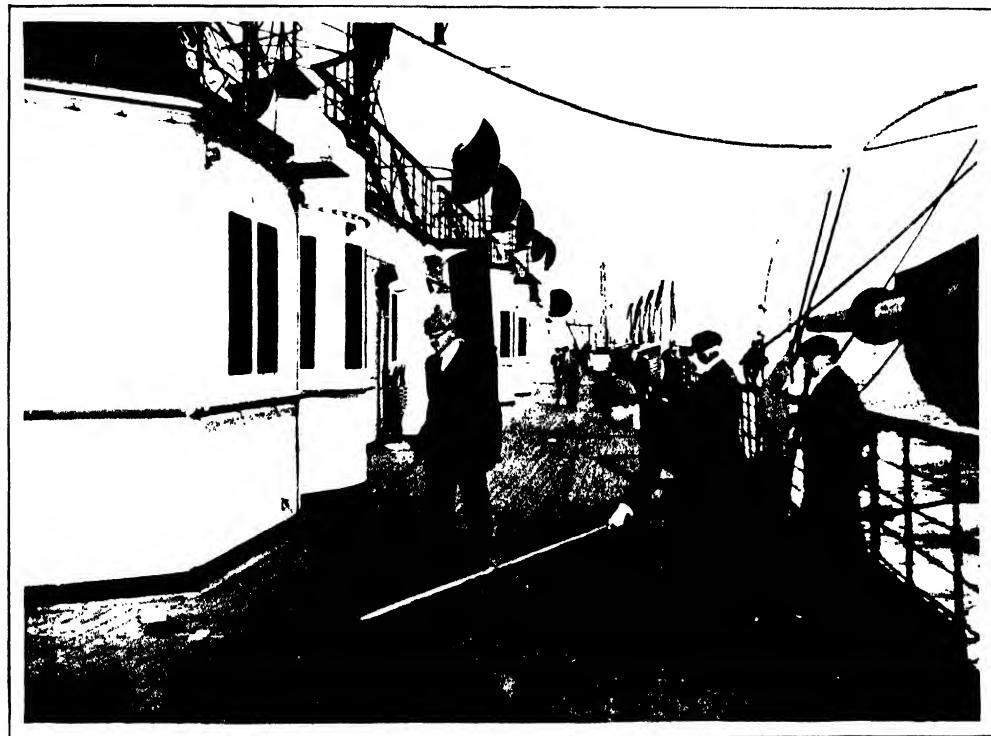
Each of the three senior officers bears his part in the navigation of the ship, and reports at noon the position he has worked out that these positions may be compared with that arrived at by the captain, lest the one mind should be guilty of error, and disaster ensue. But when four men work out what is practically the same sum the average of the four's results must be somewhere near to actuality. Noon draws near, and the seniors assemble in force on the bridge. Clouds have hung darkly over the southern horizon all forenoon, but there is a suspicion of clearance visible now. Up dart four sextants, four figures stand to attention. A wintry gleam of sunshine, it disappears it has shone only for an inappreciable second—the ordinary ob-

make the time pass handsomely ; and they have their own little coterie of stewards to attend to their every want, to bring them choice viands from the saloon, for your Atlantic officer fares as well in his mess-room as does your millionaire in his reserved suite, and if the on-deck duties are arduous the " below " life is almost convivial at times.

The life of the ship's surgeon is very similar to the life of a surgeon on shore, except that, at sea, he is tacitly expected to prove himself a man of infinite resource in the arranging of entertainments for ennuyé passengers -must get up seratch concerts, must bait the icily isolated prima donna or the opera tenor, and draw from her or him a promise to honour the coming concert with a song, pleading the saered name of charity as all excuse. Sometimes these happy-go lucky concerts develop into really magnificent entertainments; the talent is often the most

excellent that two continents can afford; and be sure the captain is very much in evidence, either as chairman of revels or as patron of the arts. But even in the midst of the most entrancing solo there is a look of suppressed anxiety in the sea-monarch's eyes; it is as if he were waiting, waiting, for that sudden call to action on the deck above.

With the purser and his assistants we have but little to do. They, again, are entertainers, but they have very real duties to perform; to them is entrusted the welfare of the cargo and the passengers' baggage, also—though as a rule the mail officer shares this responsibility with them the mails are under their care, and the Royal mails are no sinecure, be sure of that. But the duties of the clerical staff are mostly clerky, though the purser himself must stand as a buffer between captain and passenger, as between passenger and domestic department. To



An interesting game in mid-ocean on one of the decks of R.M.S. *Lusitania*.

the purser, the haughty omnipotent, the chief steward owes allegiance, and it falls to the purser's lot to see that the cuisine is as carefully upkept as that of the Carlton or the Ritz.

There are so many different branches amongst the staff of a liner that it is impossible to give more than a passing

**The
Engine-room
Staff**

glance at the majority. But there is one branch that deserves a volume to itself, the engineering branch. Down in those boiling hot-pots of engine-rooms works a miniature army of trained men, experts again at their craft, skilled surgeons attending to the steady beat of the liner's mighty heart. The engineers keep their fingers on the pulse of power, and see that it does not flag; on them depends the propelling of the fabric; to them is the credit due for those surprising dashes of speed that set the whole world marvelling. They do not show much in evidence, these engineers they prefer seclusion; for they are as hard as the steel they have been bred up with, lacking some of the nicer graces of life, maybe, but sterling men, loyal assistants, and cunning beyond the ordinary. And it may be said of them that they bear the heavier burden, in that they are penned up in an oscillating trap, battened down often enough, unable to see the perils that menace, whilst knowing that those perils are everywhere about them. And theirs is the duty of staying at their posts till the last conceivable minute; it is to them the captain looks for aid in his last emergency; they must remain below and keep the engines working even though the ship be falling swiftly to her death; they must strive to keep steam on the boilers that the gigantic pumps may do their work, and when at last the water rises and quenches the fires the engineers must first satisfy themselves of the safety of their men, and then blow the steam off the boilers, and risk their lives to do it, in order that the catastrophe may not be made worse with additional horrors from a boiler explosion.

Most sailors are brave; but the conviction is forced upon the thoughtful man that the engineers are bravest of all; for it is one thing to face a visible death, to be whipped up to courageous effort by the sight of the massed opposing forces, whilst it is a different thing to be imprisoned below the water line, there to perform multifarious duties in the midst of terrors that grow magnified incalculably by reason of their very invisibility.

The life of the fore-mast hands and the stewards is almost entirely a matter of uniform discipline. There is room for practically no individuality; the crowds that go to make up a liner's personnel move almost automatically at the dictates of the superior mind. The stewards, for example, perform the duties of the waiters of an hotel ashore; the only difference is that they must hand viands deftly round a table that is inclined at all manner of sick angles, and must, again in the interests of the line, avoid capsizing dishes of greasy food on fine silks and laces.

The actual deck staff are seldom seen by the passenger; they do their chief work whilst the voyagers sleep. At midnight the watch on deck flit like shadows here and there, coupling hoses, fetching buckets and brooms, and for the remaining hours of darkness the ship is given over almost entirely into their hands; everything that can be washed is washed clean; and passengers marvel at the orderliness of the decks after the natural confusion of a gale, when, on appearing on deck before breakfast, they see the planking shining white and the paint-

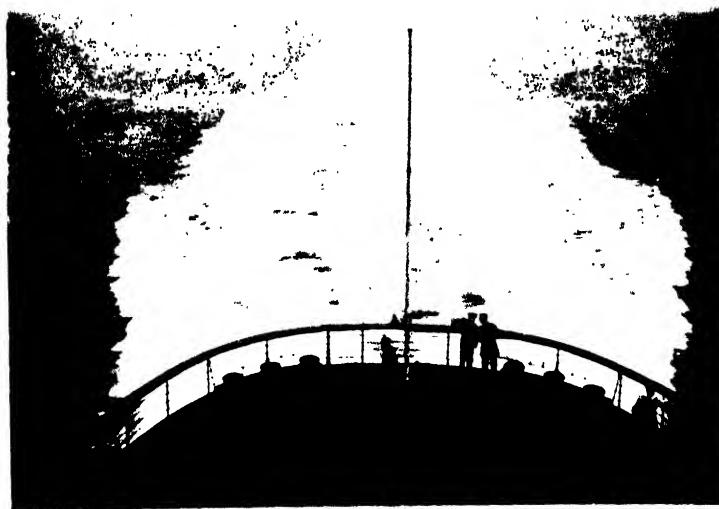
**The
Deck-hands
at Work**
work all aglow in the rays of the risen sun. Perfect cleanliness, coupled with lack of annoyance, is the keynote of a liner's régime; and the boatswain and his underlings have to attend to this matter. With a few exceptions the deck staff keep watch in the old-fashioned style—four hours on, four hours off; though the idlers—lamp-trimmers, yeomen, and the like—sleep in all night.

Every morning at ten o'clock there is a stately procession formed in the cabin. It comprises the captain, the surgeon, the purser, the master-at-arms, and the chief steward. This procession wends its way below to the steerage decks, and makes an exhaustive survey. Hospitals, sanitary arrangements, sleeping quarters, all are carefully examined, and the captain assures himself that all is right.

The life of a passenger at sea nearly approaches perfection. He has a minimum of exertion, and a maximum of comfort; he is well fed, well looked after, all that human ingenuity can do to make his journeying pleasant is done. He is fed at stated hours, and on the average well-found liner the meals are something to marvel at. The owners have an axiom that a food-filled mouth cannot grumble; and so the mouths are plentifully filled. There is every aid given to social intercourse; a luxuriously appointed music-room here invites to enjoyment; a smoking-room, the replica of a baronial hall, there, tempts devotees of nicotine to full indulgence; a drawing-room that

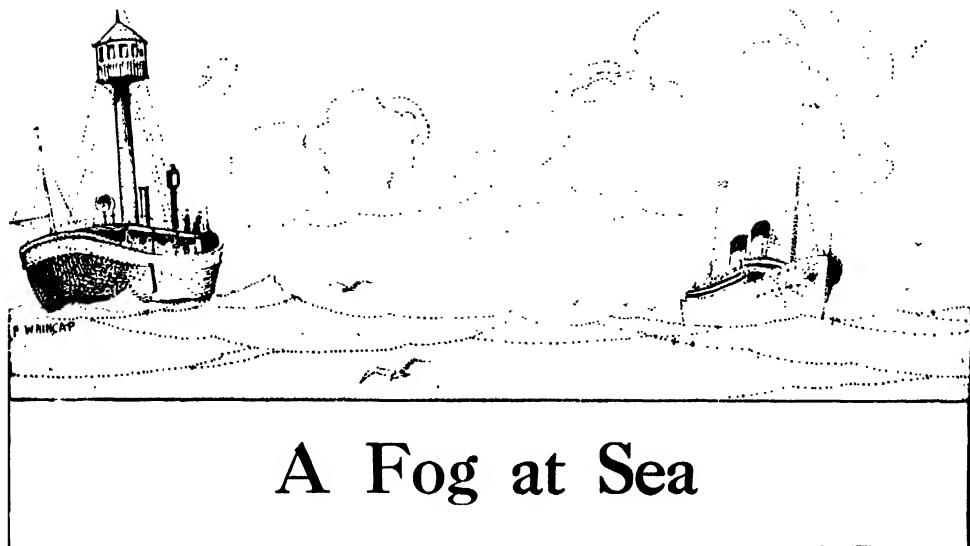
might make a duchess gasp from sheer envy; but these are mere trivialities in our modern days. The liner owners add pleasure to pleasure; they arrange for elegant ball-rooms, for swimming baths, for gymnasias life at sea is more full of excitement than is life ashore. But on the whole it is a dreamy, idle life; long, lazy hours spent in ease-bringing deck chairs, planted snugly out of reach of the biting winds, hours of marvellous cricket played with a broomstick and a ball of rope-yarns, with the added interest of the possibility of losing every second ball overboard; hours of brisk promenading on the wind-swept decks, with the licking kiss of sprays for company. The liner is a little world to itself; it has its jealousies, its enjoyments; from time to time signals from other hastening ships are recorded; and the days go by, so full of movement and life that almost before one has realised the fact that an Atlantic passage has been commenced it is finished, and the liner becomes an inert, untidy hull, lashed fast alongside some weed-grown wharf.

FRANK H. SHAW.



The Atlantic Highway.

Wide World



A Fog at Sea

BANK upon bank, wall upon wall, the grey, wet, clinging, interminable main-fog of the Atlantic rolls up the Channel, blotting out the dancing, sparkling waves, the white cliffs and swelling green downs; blotting out, to all seeming, the whole world into a hueless, viewless nothingness.

Then it is that the men who use the sea envy, with an envy so deep that it is wordless, their shore-going brethren to whom the fog is only a nuisance, not a deadly danger full of breath-stopping menace. The liners rushing home with cabins full of passengers and strong rooms laden with treasure, slow to half-speed, the captains remembering that every minute of delay in delivering His Majesty's mails means many golden sovereigns in fines; the outward bound liners creep slowly out past shoal and sand-bank, the landsmen in the chains singing a monotonous but instructive tale of "by the mark," and "by the deep." The fishing boats, coasters, and other small fry of the sea sound their bells and work their hand-power fog-horns zealously and pray. It is all they can do. At any moment a high steel

prow, driven by the power of ten thousand horse, may leap out of nothingness and cut them down to the water's edge, crushing them under to oblivion.

Since sight is useless when the fog devils wreath their coils over the waters recourse is had, perforce, to sound for giving and obtaining warning of approach. Bells are sometimes used, but a fog-horn is more usual. This is a kind of roaring trumpet, actuated either by steam or with just a hand bellows. It is sounded at regular intervals, and the Board of Trade have devised a series of signals, based on the Morse code of "longs and shorts," by which a vessel can make known its course and intentions to another vessel approaching.

Nothing can be more melancholy than the sound of a number of fog-horns all bellowing together, and sometimes when fog descends on a busy port, and a number of ingoing and outgoing vessels are all held up for a day or so, as they were at the mouth of the Mersey a few years back, an effect is produced that is truly nerve-racking.

The "syren," an improved fog-horn in which the sound is produced by the rapid revolution of a slotted disc which allows steam or air to escape in a number

of tiny spurts, is very much used by steamships. The note of the "syren" starts low and rises to a high shriek as the revolution of the disc becomes more and more rapid. It has great penetrating qualities, and will carry over a long distance.

Bell buoys and whistling buoys are just as useful to the mariner in a fog as they are at night for warning him from hidden dangers, whilst lightships and lighthouses add to their usefulness by giving either syren signals or by firing guns or detonators.

The wireless telegraph has done something to rob the fog of its terrors, but the most wonderful invention yet brought into use for fighting the fog is the submarine signalling bell. The simplicity of the system is one of its chief recommendations.

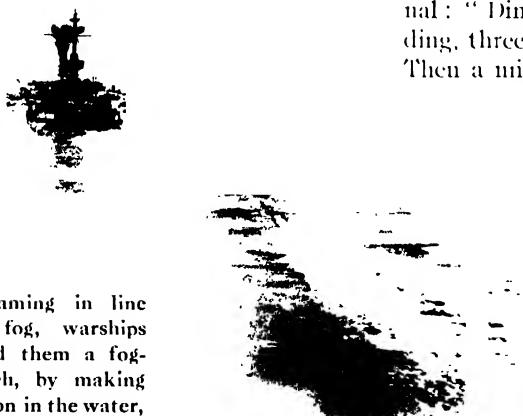
Water carries sound four times more quickly than air, and as long ago as 1826 an ingenious scientist was experimenting with an under water bell upon Lake

adopted by the United States and by Trinity House.

The "stationary," or warning, bell is fixed under water on a rocky coast, over a shoal or beneath a lightship, and is rung either by compressed air or by electricity. Each bell has its own particular signal. One station or lightship, for instance, will automatically give out this signal: "Ding, ding, three seconds' pause. Ding, ding." Then a minute's pause and begin again. Another will ring like this: "Ding, ding, ding, two seconds' pause, ding, ding, ding, two seconds' pause," and so on continuously.

The really wonderful part of the invention is, however, the "ears" that are fitted to ships to enable them to hear these signals. These "ears" consist of two tanks about twenty-two

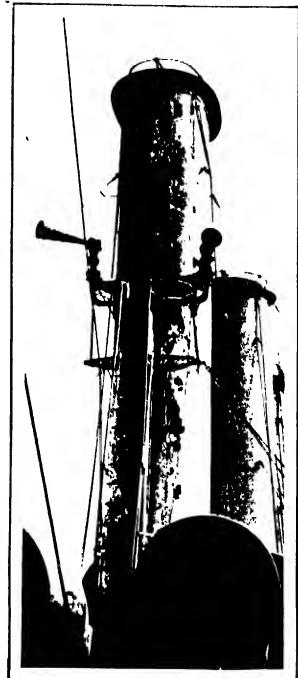
inches square, filled with sea water, fastened securely against the inside of the skin of the ship, well below the water line, one on the port, and one on the starboard side, at a distance from the bow which



When steaming in line during a fog, warships tow behind them a fog-buoy, which, by making a commotion in the water, enables the next astern to keep her distance.

Geneva; but nothing practical was done to utilise the splendid sound-carrying capabilities of water until ten years ago. Since that time submarine signalling has advanced rapidly, and has been largely

Photo: R. S. G.



The syrens on H.M.S. *Amethyst*. Syrens are used for signalling, particularly during foggy weather.

The Sea and its Story

varies according to the shape of the ship. Within these boxes are suspended delicate electric instruments known as microphones, which are capable of detecting the faintest sound. The microphones are connected with telephone wires which are carried to the bridge or pilot-house, where two sets of telephone ear-pieces are provided so that two officers on the bridge or in the pilot-house can listen simultaneously. So perfect is the instrument that the turning of a switch will tell the listener whether the sound is coming from the port side, the starboard side, or straight ahead. This device, though it has not been in use for long, has already been instrumental in saving many lives and much property.

The navy, whilst adopting the usual

when two or more vessels of the navy are steaming together it is usual for them to proceed either in single or double file, keeping a regular distance from one another. This keeping of distance is very important, as upon it depends the safety of, maybe, the whole squadron, and to make it not impossible in foggy weather a "fog buoy" is dragged through the water after each ship. This buoy consists of an irregular-shaped piece of wood so slung to the end of a long rope that it makes a big splutter and commotion in passing through the water. This noise is readily distinguished by the look-out in the bows of the next warship astern, and distance is by its aid correctly kept.

In the navy, as in the merchant service, the lead is very much used in time of fog. By its aid a skilful navigator can tell approximately where he is, for, by placing some tallow in a hollow at the bottom of the lead a small portion of the bed of the sea is brought to the surface. The character of the material is quite enough for the average navigating officer to go by. The fishermen of the south and west coasts very often depend on their sense of smell to tell them their whereabouts, sniffing prodigiously at the lead as it comes up from the bottom and apparently gaining a deal of knowledge through their nostrils.

Fog is one of the deadliest enemies of shipping the world over, and the

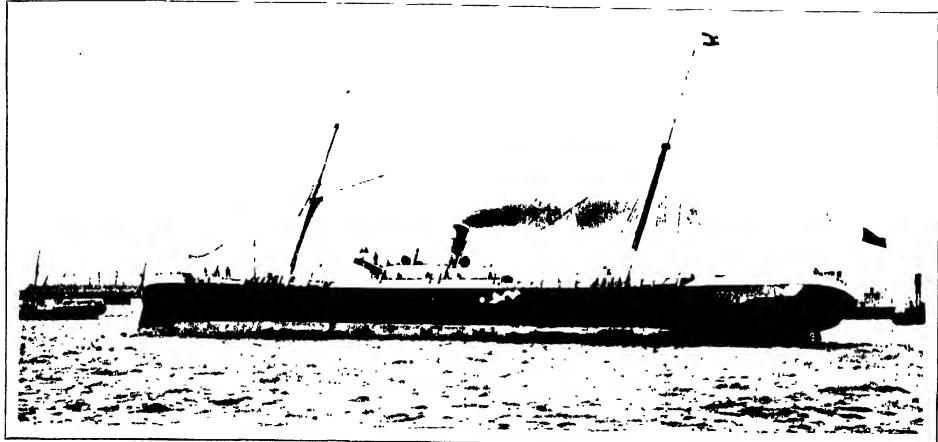
reason there are not more accidents and loss of life because of it can only be accounted for by the very wholesome dread the sailorman has for the fog fiend.

ERNEST H. ROBINSON.



Photo: Superior Cobb
curious photograph showing the leadsmen's platform
on a man-o'-war.

rules and regulations for use when fog disorganises sea traffic, has many special and ingenious devices of its own. One of the most interesting of these is known as the fog buoy. As most folk are aware,



Photo, Prestwich & Son.

An interesting photograph of a tramp steamer coming into port with a shifted cargo.
Note how she is heeling over to starboard.

The Ocean Tramp

THE ocean tramp may be likened to the paid adventurer of the sea. In an age when sea-routes are as well known and as regularly followed as the railway lines that intersect any land, there is little but what is prosaic and usual in the voyaging of a ship ; but whilst the leviathan liners throb their way along the ocean-lanes from land to land with the regularity and reliability of express trains, it must be borne in mind that there is a vast flotilla—a sort of middle-class stratum—of other vessels, both steam and sail, which go everywhere, and do everything, and these taste the full reality of the romantic side of the seafaring life. Like the middle-class of England they are the real backbone of our ocean supremacy, and they breed sailors who are ready to go anywhere and face anything.

Their voyaging may be romantic, but their outward appearance is certainly not picturesque. On the contrary, they

are usually somewhat rusty as to plates and funnel ; their paint work is not all that could be desired ; they are ugly of shape, cumbersome of line, to the eye that has dwelt with pride on the graceful curves of a speedy liner or the purposeful bulkiness of a "Dreadnought," and generally present a sort of dishevelled appearance. They are always either loading or discharging cargo ; and in port their decks are a sight for the gods, littered with dunnage-wood, coal and refuse. But they serve a very real purpose in the scheme of things nautical.

Sometimes these tramps belong to recognised lines, and ply with a certain amount of regularity to specified ports, but then, when they have reached this stage they are shedding their outer skin of pure trampishness, and are beginning to assume airs, and call themselves regular liners ; their officers sew gold braid on to the cuffs of their coats, and wear badge-caps. But the tramp, pure and simple, has no regular route ; she is at the mercy of her owner and also of any

charterer who might happen to come along with tempting offers of freight.

Usually the tramp proper is a steamer of from fifteen hundred to five thousand tons register. She is built economically; there are few embellishments to be observed about her, none of those adornments of teak wood and gold paint so

dear to the eye

**The
Motto of the
Tramp**

of the nautical man.

Her motto is "small profits and quick returns," and she is essentially workman-like. With a crew numbering perhaps twenty-two or twenty-three men, with a hold capable of receiving a vast amount of cargo, she will go forth from her home port openly "on the make"; and once the greasy smoke from her rusty funnel has dissolved into the clouds that lie low on the horizon she stands a remarkably good chance of remaining away from her port for a considerable time. There are no time-tables where the tramp is concerned. She may be chartered to sail from London to Buenos Aires, say, with a general cargo, comprising, in the main, railway material, from a bundle of fish-plates to a fifty-ton boiler. She has a steaming capacity of perhaps ten knots an hour, though her chief engineer prefers her to steam at eight, as that saves coal and also wear and tear of engines, which are none too sound; for the ideal tramp is often a cast liner of sorts, aged and worn, driven from the regular routes by the advancement of shipbuilding and the requirements of a more fastidious generation of passengers.

She burns twenty tons of coal a day, therefore she is cheap to run; and as railway material is not generally wanted in such haste as perishable goods, she can take her own time, and so cut freights considerably. She sags away dubiously south and west, buckets her uncomfortable path across the Bay—where she probably loses a man, for she is piled high with deck cargo, and it is treacherous work to walk a hampered iron deck in a seaway; ratches away to the smoother

waters of the Trades, and eventually puts her bow into the muddy River Plate. Then she ties up at the Boca, and waits for her consignees to arouse themselves from their Latin calm so that she may discharge the load she had carried so far.

Whilst in port her crew either work out the cargo or busy themselves in painting the ship, using cheap paint and little of it, for the ship must earn dividends for her owners. Then, the cargo being safely delivered, the skipper looks about for more. He does not know where his next destination may be; but he has charts of all the world's seas in his room, and is as ready to fare forth to Japan as he is to coast up the Brazilian shores, calling at a few unconsidered ports for coffee, and delivering his accumulated harvest in New York. Until the captain has seen his agent, supposing his owners have an appointed agent in the port, he does not know where he may be going. But sometimes there is no agent, and then the skipper has to interview shippers in person, and get what cargoes he can, keeping always an eye on the capabilities of his craft and on the freight offered. If Buenos Aires does not promise well he may fill his ballast tanks, trim his bunker coal, and wend his wheezy way to other places where richer freights may safely be had. But it may happen that the Plate port has something to offer, even if it be only bones and hides, or, better still, from the owner's point of view, much worse from the sailor's, cattle for South Africa. Then the tramp becomes a floating farmyard for the nonce. Her 'tween decks are fitted with

**A
Floating
Farmyard**

rough stalls, her decks are covered in with a light deck of match-wood, and under this temporary deck are arranged still more cattle stalls, whilst above are built huge pens for sheep. Hay is piled on every open space, and when she leaves her port she seems a moving mass of lowing, bleating animality, topped by tier on tier of compressed hay.

South Africa will probably offer no

freight worthy the name ; therefore the ballast tanks are filled again, and she sets off purposefully for some port where better pickings may be had. The Far

she is on the move, with a keen nose for freights, ready to go anywhere ; particularly happy if a war breaks out anywhere so that she can raise an extra

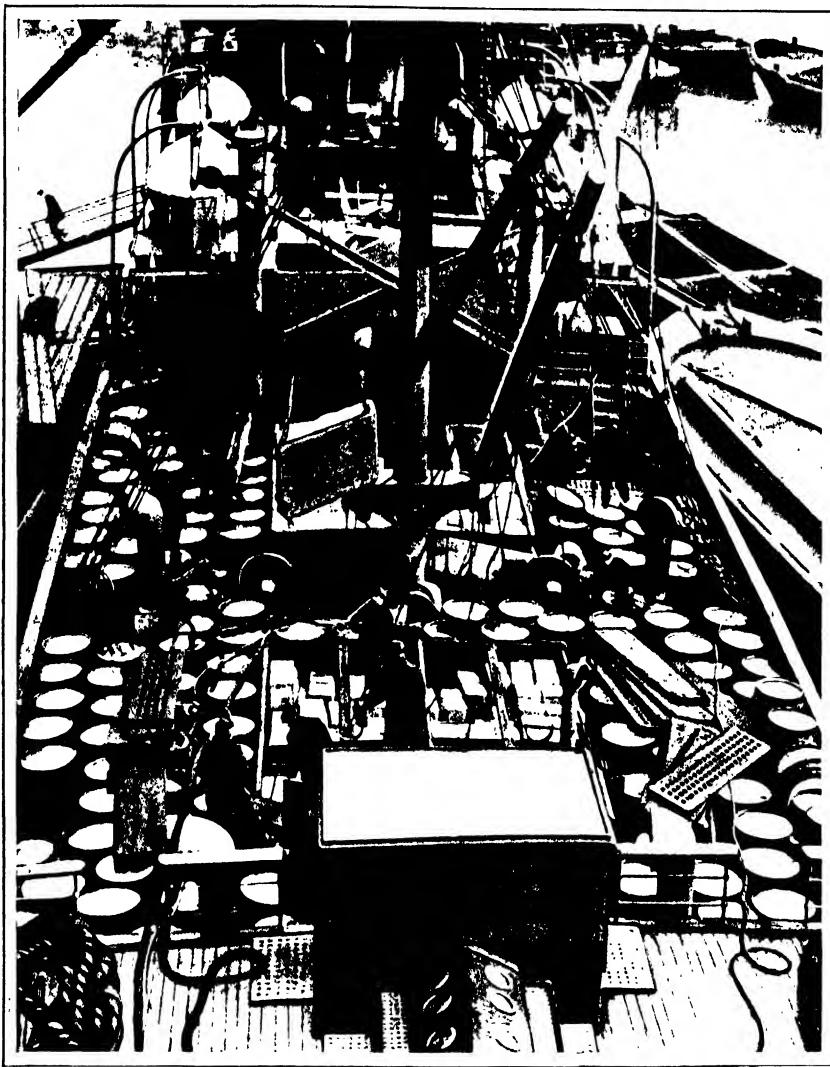


Photo: G. C. & H.
Tramp steamers often carry cargo of an imperishable nature on their decks.
This picture shows a coasting tramp getting on board a final few tons.

East is the happy hunting ground of this type of vessel ; and many a tramp goes out to the Chinese coasts and stays there until her captain grows grey-headed and her officers leave one by one as the term of their agreements expires. Always

bound a ton for war risks, and carry contraband of war to one or other of the belligerents.

She changes her crews as she goes along. Her original men leave her and ship aboard homeward bounders ; her skipper

signs on fresh hands, and after a lapse of a year or so she is probably Chinese as far as the language spoken aboard her is concerned, and the only British things about her are her bluff, untidy captain, her engineers, and the flag she flies at her stern.

But she is always making money in an unostentatious way. Full dress for her officers is an old duck suit, worn canvas shoes, and a peaked cap; anything beyond this would be considered "sidey." Her larger compatriots treat her with open disdain; she seems to feel this and sidles in and out of port in an inconspicuous fashion, like a poor relative who is afraid of a snub.

She may, on the other hand, elect to try her fortunes nearer home, and ply between a dozen home ports and the Black Sea, taking out coal and bringing home grain in the grain season, tallow and wool at other times. Or she may run across the Bay to Bilbao, loaded to her scuppers with coal, her hatches off that the explosive gases may escape, bucketting into the worst Biscay howler that ever blew, her engines slowed down to a crawl lest the pitching of the ship should cause the engines to race and shatter them or shake the propeller off into deep water. Somehow she delivers her cargo, and at once wheezes her way to the ore tips, fills her spacious holds with heavy iron or copper ore, and again takes to the open water, every plate and stringer in her composition protesting at this unkindly treatment, for iron ore is a treacherous cargo, shunned by more respectable ships,

Overloaded and Undermanned and looked upon as a legitimate picking for the tramp.

She is certainly not conducted on mail-boat lines. There is work to be done aboard her, and an insufficient crew—two hands to a watch, maybe, or at the best three. Therefore her officers must toil like the men, or else steer for all their watch, in order that a valuable hand may be spared to labour about the decks.

Since economy is her ruling motto she gets coals where they are cheapest; and much of her crew's time is spent in shipping this coal from hold to bunker, so that she is always grimy. She is seldom very clean at all, except on the one day when she arrives in her home port, and is due to be inspected by the engineer who is called her **Cleaning Up** marine surveyor. Then she is washed from [^]**Tramp** bow to stern, her funnel is given a new coat of paint, and she shines resplendent, until the surveyor says, "Yes, she'll do; now get her under the coal shoots," and all the glory of paint and varnish vanishes under thick layers of coal dust.

It is no uncommon sight in the Channel to see, at night, two red lights blazing bravely above a ship's ordinary side-lights, and at once the observer jumps to the conclusion that here is a vessel in distress. Nothing of the sort; it is only our economical tramp busy at cleaning out her holds, with all hands engaged to the full. She has stopped her engines so that the watch officer and helmsman may be spared; and there she lies at large, shunned by all the crowded traffic of the seas, saving and making money as fast as she can.

She might, again, be engaged in the West African coasting trade. She is loaded with a cargo of Manchester cottons, gin-crack guns, and green cases of trade gin. In the grey dawn of a tropical morning she makes her way in towards the low-lying, mango-perfumed land, to where the Atlantic breaks boisterously on a hidden river bar; and here she drops her anchor, whilst her steam whistle makes hideous the pure dawn. The palm-fringed shore wakens to life at her advent; from the big trading factory, which is all that exists in the way of a port, streams of Kroobays emerge, rolling palm-oil casks down to the edge of the water, and loading them into unwieldy lighters, supposing there is no possibility of the tramp crossing the bar. After a while

lighters steal out and range themselves alongside the tramp, heaving and groaning to the drag of the guess-warp, with their crews yelling and chattering like monkeys; and bale by bale, case by case, the cargo is delivered, to be replaced by the oil and ivory of commerce; whilst a sallow-faced trader sits in the cabin and smokes the cigars which the skipper has brought for the purpose of putting him into a good humour. Then she steams away along the coast by night, keeping outside seven fathoms and inside seventeen, to repeat the dose *ad infinitum*.

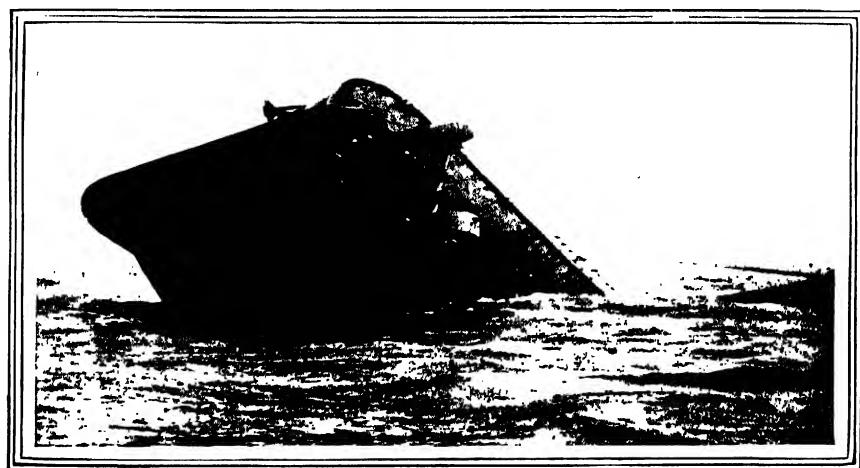
If there is no pronounced bar, and the mouth of the river is fairly open, the tramp forces her way into what is practically virgin forest, with her derricks brushing aside the foliage and her men keeping the lead constantly going as the river shallows, until she is brought abreast some rough station and her derrick chains are hove ashore to the waiting Kroobois, who will hook on cask after cask, and to the accompaniment of vociferous clamour, send the cargo crashing aboard. And the tramp's crew toil on sweatingly baked by the African sun all day, chilled by the fever-laden mists all night—not complaining unduly, for they are used to it all; and spending what small leisure they might have in bartering trifles of cutlery

and sham jewellery with the natives for parrots and monkeys, which they will sell on their return at a gorgeous profit.

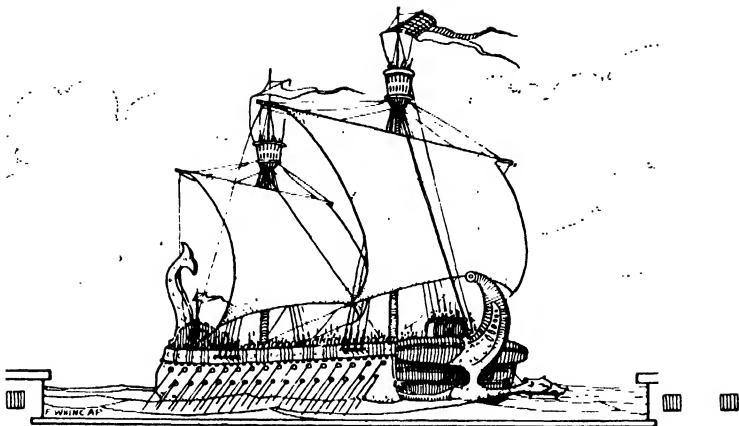
Undoubtedly the tramp may be considered a picker-up of unconsidered trifles; she clutches feverishly at the cargoes the regular liners disdain to look at. And her owners grow fat on the proceeds of her work the while they bemoan the falling off of profits.

In these days every sailing ship is a tramp. I know dozens of sailing ships that hardly know the meaning of Home-ward Bound. They set off from home with confidence, expecting to return within a year, but no. They go to Australia with "general," and from Newcastle, N.S.W., they sail with coal to South America or Frisco. They may take a cargo from Nagasaki to New York, load up there with case oil, and fare round the Horn once more for the East, until the ship seems almost able to find her own way without being piloted; but home has become a thing unspoken of, hardly even thought of, for the tramp, as her name implies, is a homeless outcast—a waif upon the wide waters of the world. Like the ravens she seeks her meat from God, and generally manages to stow away a very satisfactory meal.

FRANK H. SHAW.



Phot. G. G. & S. Co., Penzance.
Down to "Davy Jones." The last scene in a tramp's life story.



The Beginnings of Navigation

THIE beginnings of Navigation are shrouded in the mists that hide from our ken those mysterious times before the dawn of history. The Chinese, who lay claim to being the first in most things, state that their voluminous histories prove them to have been the first navigators; but their chronicled discoveries are inconsiderable, and their pretensions may be dismissed from our consideration of the subject. Undoubtedly they were the first in discovering the peculiar properties of the magnetic needle, but, since they made but little practical use of it, the honour is an empty one.

Navigation, implying the use of ships, or large boats capable of making a considerable voyage, had its birth, as far as we can tell, in the eastern end of the Mediterranean. With the dawn of history there were three great nations of mariners in this corner of the inland sea; and the glory of two of them was already waning before the rise of the third. Of the Egyptians as a maritime nation we know little. Of the Phœnicians, their first rivals, the authentic records are nearly

as scanty. But we do know that these two nations, between them, led the way for the Greeks, and gave that brilliant people the hints they were so quick to follow up.

And we also know enough to make sure that there was a distinct difference of character between the Egyptian and Phœnician mariners. The former were a timid race, keeping close to the Nile, hating the sea, and creeping about from place to place along the coasts of Asia Minor and Greece, as the prospect of rich trade overcame their fears. The Phœnicians—that dark, impenetrable, romantic people—launched out more boldly. The reader will remember the account of Solomon's navy in the First Book of Kings, and of the help given him by Hiram, the Phœnician King of Tyre: "The king had at sea a navy of Tharshish with the navy of Hiram: once in three years came the navy of Tharshish, bringing gold, and silver, ivory, and apes, and peacocks."

The Bible record belongs to a period long after the Phœnicians had established themselves as the great carrying nation of the then known world. Phœnicia, like most other peculiarly maritime

nations, was but a small country. It had, indeed, an area less than that of Yorkshire. In this regard it is curious to notice how many small nations or bodies of people have set their mark on the world by reason of their prowess upon the sea. In ancient times there were Greece and Carthage besides Phoenicia. Then in the Middle Ages we have Genoa, Venice, and Florence, as well as the Hansa towns, and later still Holland, Portugal, and Britain.

In the case of Phœnicia, the reason the people took to the sea is not far to seek. Their land was rugged and not over productive, whilst along two hundred miles of coast-line smiled a sea which was ready to render to them its treasures. And one treasure it had which without any exaggeration may be called the foundation of the Phœnician greatness. This treasure was the colourless, creamy, garlic-smelling liquid contained in a tiny sac behind the head of two different kinds of mollusc which abound in the eastern waters of the Mediterranean. This liquid, when applied to fabrics of cotton, wool, or linen, and exposed to the sunlight, turns first green, then blue, and then red. When the dyed material is washed in soap and water this last colour turns to a gorgeous permanent crimson, which was the famous Tyrian purple. The search for the best fish, to supply the ever-growing demands for the purple, tempted the Phœnicians further and further from the shore, and turned them into a nation of bold and fearless navigators.

The first ships of the Phœnicians were

The First Sea Ships merely open boats, with perhaps a small deck at the bow.

They were roughly

built of cedar or fir, and caulked with bitumen. The bravery of sailors who would venture on long voyages in such craft, at the mercy of every wave and every wind, with little or no knowledge and no navigating instruments, is something to be wondered at. Yet in them they braved the dread "levanter," a wind that even

modern sailors, with all their appliances, dread, and adventured all up and down the inland seas.

In these very early times the method of propulsion that was chiefly relied upon was rowing, though when the wind served they used one large square sail, which, according to ancient pictures, was reefed in the manner still adopted in our sailing ships. The rowers numbered but ten or

Fifty Oars
to
One Craft

twelve at first, but later as many as fifty, or even more, oars were employed, often arranged in two tiers, as in the "bireme," which was evolved about the thirteenth century B.C.

The Phœnicians founded the colony of Carthage, which soon took from the parent state the proud title of "mistress of the sea." The Carthaginians used the stars as their guides, and instead of hugging the shores as had done the Phœnicians to a great extent, they boldly dared the trackless main; and, passing the Pillars of Hercules, reached the British Isles to the north-west and sailed southward for some distance along the west coast of Africa.

The wonder and romance of these voyages was constantly a theme for ancient poets, and perhaps we cannot get a better account of how a long voyage must have stirred the imagination and taxed the manhood of those early shipmen than by listening whilst Homer tells the tale of the voyage of the Argonauts, a body of fearless young men who went with Jason to fetch back the stolen Golden Fleece from the terrible unknown land of Colchis and to win for him a kingdom. Of course, the story is packed full of impossibilities, but doubtless Homer talked with many mariners of his time, and underneath the fable and the uncomprehending terror of the unknown is much that must have been a true account of the adventures of the early Greek voyagers and their Phœnician and Carthaginian predecessors.

Jason, and the heroes who were to go with him, themselves felled the pines for

their craft, and dragged them down to the shore, and shaped them with the axe ; and there, under the direction of Argus, the skilful shipwright, they built the first long ship that ever sailed upon the seas. They pierced her for fifty oars—one for each of the crew—and pitched her with pitch, and painted her bows with

**The Building
of
the Argo** vermillion ; and they named her *Argo*, after her designer.

Whilst they were at work came Orpheus, the last to join them, the prince of minstrels, whose music could charm the beasts of the forests and the trees and the rocks themselves. For weeks the heroes worked and were feasted and slept in the porch of the palace of the king, whose throne Jason would claim when he had achieved the Fleece. At length the ship was finished, but when they tried to launch her down the beach she was too heavy, and her keel sank deep in the sand. Then, says the legend, whilst they stood helpless, looking at one another, Orpheus, the minstrel, took his lute and began a magic song. He sang of leaping waves and flashing oars, and a fair wind singing in the cordage ; of strange towns by foreign shores, full of merchandise and treasure ; of sea-nymphs and monsters and palaces with "Charmed magic casements, opening on the foam of perilous seas." *Argo*, the good ship, heard him ; she felt a longing in all her timbers to meet the sea, to ride upon it, and be away. She heaved from stem to stern ; she leaped in the sand. The heroes thrust rollers under her stem, and like a gallant horse, she plunged down the beach to the sea.

The heroes stored her with provisions and made their preparations complete, then they pulled the gangway in. They poured drink-offerings to their gods, and set themselves each man to his oar, still keeping time to Orpheus's lute. So they rowed southward across the bay. Soon the night fell and the people along the beach faded from sight. The white walls of the town they had left grew dim and

disappeared. They were alone under the starlit dome of Heaven. The great voyage had commenced. All night long and through the dawn the good ship *Argo* kept her way.

At first they came to Aphetae, across the bay, and while they waited there for the south-west wind they chose themselves a captain. The choice at first fell upon Heracles, as being the mightiest ; but Heracles declined and called upon Jason, with whom the whole expedition had taken its rise. This seemed just to the heroes, so Jason was chosen. Then, the south-west wind having sprung up, they sailed eastward past the island of Sciathos, leaving the Cape of Sepius on their left, and turned northwards past Pelion until in due time they came to the Hellespont, and sailed through the narrow channel of Abydos (now called the Dardanelles) into the Propontis (Sea of Marmora). Through this sea they went, with many adventures, and out through the upper channel (Bosphorus) in the Euxine or Black Sea.

No Greek had ever adventured into this sea before, and to Jason and his companions it seemed a place of unnamable dread. Men said that it stretched northward until it washed the shores of night itself and the regions of the dead. But the heroes pushed on, impelled by that insatiable spirit of curiosity which has been the motive force of all great achievement in exploration. To their many fears Orpheus added another : "This is the place of the wandering rocks, blue and terrible, of which we have heard," he cried.

Hardly had he spoken when they saw the steel-blue rocks ahead of them, with their cliffs rising sheer and smooth as glass from the sea. An icy wind blew from them and chilled the heroes' hearts. As they drew nearer they saw the rocks heaving and clashing together on the roll of the sea, the waves hurling themselves up in spouts between them.

"Between these rocks," said Orpheus

The Wandering Rocks

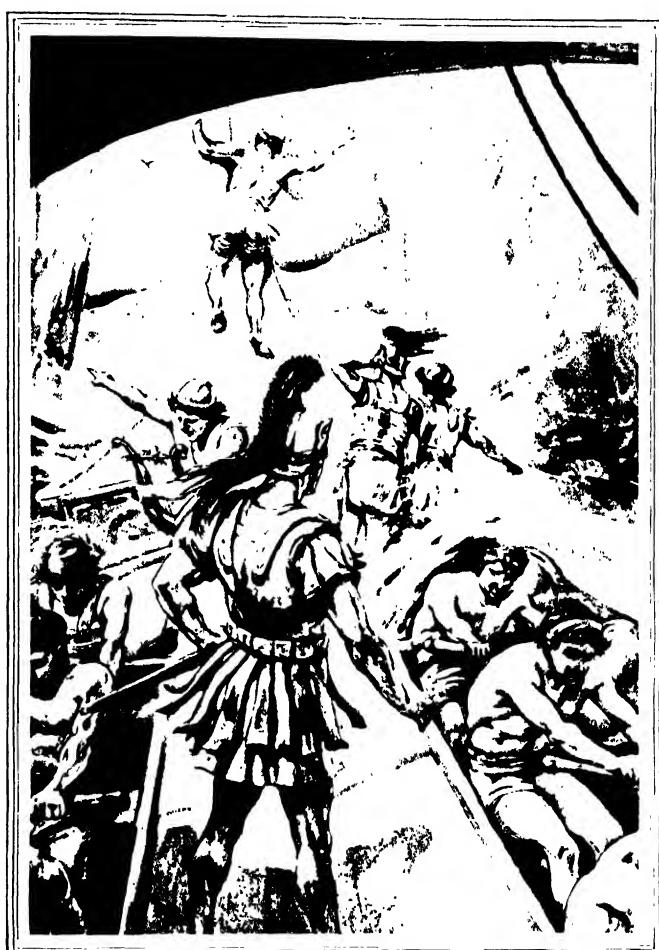
to the helmsman, " we must pass as they drift apart for awhile, before they meet again and grind us to powder. Watch, therefore, for an opening ; and be of good cheer."

But Tiphys, the helmsman, stood silent and clenched his teeth, bending low to search for an opening. Just then he saw a tall heron fly mast-high towards the rocks, and hover for awhile before them, as if seeking for a passage through. " Hera, Queen of Heaven, has sent us this bird ! " he cried. " Let us watch and follow him."

The heron flapped his wings slowly before the face of the cliff until he spied an opening between the rocks. Into this he darted, while the heroes watched what would happen. As the bird shot through, the blue rocks clashed together, striking one feather from the heron's tail, then rebounded from the shock, leaving just room enough for the *Argo* to pass. Tiphys called on the heroes, and they answered his shout ; the oars bent like thin wands, the foam flew, and they shot in between the cold blue cliffs. Before the rocks had clashed together again they had passed through, and were drawing long breaths, safe in the open sea.

It is impossible to suppose that a couple of icebergs could have found their way into the Black Sea, but nobody who has seen an iceberg will doubt that this account of the " Wandering Rocks " is an attempt to describe two of these terrors of the mariner in more northern

seas. The cliffs, " sheer and smooth as glass " ; the rocks, " heaving and clashing together " ; the waves, " spouting up " ; the blue colour and, above all, the " chill wind " which blew from them, all point the way for an inevitable conclusion. To make a perilous passage between two grinding, heaving bergs is an adventure that has come within the experience of many latter-day whalers and voyagers in low latitudes, and doubt-



The blue rocks struck together and then rebounded with the shock, leaving just room enough for the *Argo* to pass.

less the poet had heard of the terrible experiences of some bold sailor who, even in those early times, had ventured so far afield from his sunny native sea that

a southerly wandering berg or two had burst upon his astonished sight. Having no knowledge of the peculiar nature of these "rocks," what is more natural than that the poet, impressed with the wonder of the tale, should incorporate it in his narrative?

Having successfully braved this danger,

An Early Sailor's Grave the voyagers came to the Asian coast—

the south coast of the Black Sea—and cruised along it as far as Sinope. But, landing on the way, they lost their helmsman, Tiphys, who was slain by a wild boar. They buried him on the Lycian shore, heaping a mound over him, upon which they stuck a steering oar by way of monument and took to their ship again.

After Sinope they passed, still running east, the coasts of many warlike tribes, and the cities of the Amazons and the shore of the Chalybes. Here all night, as they sailed along, they heard the clang of hammers and the roaring of bellows, and could see the forge fires glowing inland in the mountain glens, for the Chalybes were a race of smiths, and worked day and night forging the weapons of Ares, the war god.

But, at length, there came a day when, looking eastward, they saw a mighty mountain range, with great snow-plains glittering high above the clouds, and then they knew they were come to Caucasus, the highest of all mountains and the end of all the earth. For three days they rowed towards it. Then they described the pine forests at its base, and the mouth of the river Phasis; and, above the trees, the shining roofs of the palaces of King Æëtes, the child of the sun, who had the Golden Fleece in keeping. They turned their boat's prow to the mouth of the Phasis, entered the estuary, and rowed up between the reedy banks of the river. The first part of their adventure was accomplished.

Now, in the convenient way things happened in these old legends, a dream had come to the aged King Æëtes on the

previous night. He had a beautiful daughter called Medea; and in his dream he thought he saw a brilliant star falling from Heaven into his daughter's lap. Then it seemed that Medea took it up gladly and carried it down to the riverside where she cast it in. The rushing waters seized it, sweeping it along until it was lost to sight in the mysteries of the Euxine Sea.

The dream troubled him, so that he rose early in the morning, calling for his chariot, that he might go down and appease the spirits that haunted the river. Medea went with him, and behind followed his train of soldiers and servants. As he drove by the riverside he saw the *Argo* coming towards him, crowded with young men like gods for beauty and strength. Seeing him the heroes in their turn were astonished, for he was a mighty king to look upon. They ceased rowing, whilst Æëtes called across the water, demanding to know who they were and what was their business.

In those days, when two ships met or a ship came to land, the first question was "Are you a pirate?" If the answer was "yes," then there ensued a fight; if "no," peaceful trade or civil greetings signalled the meeting. Jason answered the king softly, but at the same time he firmly demanded the Golden Fleece which he had been sent to fetch, intimating that they were ready to fight for it.

Then Æëtes dissembled his rage, answering curtly, "If you fight with my Colchians, they will destroy you to a man. But if you are ruled by my advice you will choose the best man of your company and let him perform the tasks I shall set him.

The Quest of the Fleece
And I warn you that many labours must be fulfilled before the Golden Fleece is won."

Having said this he turned his horses' heads towards the town and drove away. But Medea, his dark-browed daughter, lingered behind. Her heart had already gone out to these handsome heroes, and

above all to Jason. Despite her beauty, the reputation of Medea was not a savoury one. She had the name of being a witch, and boasted her skill in the use of all the magic herbs that grew upon Caucasus. She spoke with the heroes, and promised them that if they would send Jason as their champion she would help him to steal away the Golden Fleece. "Only," she added, "if you take the Fleece you must take me also. For when my father discovers that I have helped you he will surely kill me, if he can." The heroes answered, "If you die, we all die with you. But home we will not go unless we bear the Golden Fleece on board."

So it was agreed. That night the heroes brought their ship silently up to the wood-side under the town, mooring her there by the bank. In the darkness Jason crept on shore and stole up to the town. Beneath the walls he saw the white robe of Medea shimmering in the starlight. She had brought her young brother with her, and the three met in silence.

After some purely mythical adventures,—the meaning of which is now lost, and which, moreover, would be out of place in this article—Jason found the Fleece and fled with it to the shore, followed hotfoot by Medea and her brother. The town was up behind them: a furious hue and cry sped their steps; they had no time to spare.

They rushed down through the dark perfume-laden gardens to the bank where



In their tiny open boats the Phoenicians braved the dread "levanter," a wind which even modern sailors dread.

the *Argo* lay, and leaped on board. The heroes all sat ready on their thwarts and bent to the oars at once. The ship surged slowly forward past gardens and roads and reedy meadows and through the yeasty smother of the river-bar, gathering way as she went, until she leaped to meet the combers of the open sea. Before morning broke they were far from the shore, steadily rowing westward.

But they were not yet clear. Eëtes manned his fleet in haste and followed them. From the deck of the *Argo* the heroes despaired them at noon—a hundred in number—following fast.

Then began a race for life. The long sweeps bent like whips as the crew of the *Argo* tugged desperately at them. Hour by hour the pursuers gained, their thousands of oars churning the water into a white foam. Medea, standing in the stern of the *Argo*, the wind of their progress blowing her dark hair over her face, grew desperate. To be caught meant death to her companions, but it meant worse to

stopped to lament the death of the king's son, and the *Argo* got clear away.

Though they had escaped, things went badly with the Argonauts from that moment. Terrific storms swept the *Argo* back and forth, so that they lost all sense of direction, and for days and days the ship weltered in unknown seas without a reckoning. Clouds obscured the stars by night, and mists shut in the horizon by day, so that the adventurers lost heart and pulled in their oars. There could be no sense in rowing when no man knew whither they went.

Drifting aimlessly the *Argo* struck a sandy shore and lay there at the mercy of the waves, even the crew giving themselves up for lost. Shipwreck is bad enough in these days, but what must it have been in those times, when to the natural terrors of the sea were added those of an uncomprehending fear? Jason and his companions attributed their bad fortune to Medea's murder of her brother, but having given her their word to protect her they could not purify her. They could only wait, with fear-stopped hearts, the unthinkable horror that they were sure the great gods would visit upon them as a punishment for their association with her. However, death and destruction were not to be their portion. The



For nine weary days they hauled their ship over the sands with ropes and rollers.

her. In a frenzy of fear she plunged her dagger again and again into the body of her young brother and cast the corpse into the sea. The ruse succeeded. The fleet

sea grew calmer, and a spring tide floated their ship off the shore. Then the winds took charge again. They were driven across the Euxine as far as the Cimmerian

Bosphorus beside the Crimea ; and there they passed (we are using modern names now) through the Straits of Kerteh into the languid Sea of Azov—Lake Macotis they called it. Thence they made their way into the Tanais (the river Don), and sailed up past the Russian steppes towards the Ural Mountains. The legend has it that wonderful tribes inhabited these countries—the Sauro-matae, descendants of the Amazons ; the one-eyed Arimaspians, who obtained gold from the Ural Mountains, stealing it from the Griffins ; the Seythians ; the Tauri, who decorate their roofs with the heads of their enemies ; and the Hyperboreans, who dwell farthest north of all men. And so they came into the northern ocean, the heavy, listless Cronian Sea.

In regard to this voyage from the Sea of Azov to the "Cronian" Sea, by which the Baltic is undoubtedly indicated, it is well to remind the reader who is following these early navigators that the chronicler is here drawing upon his imagination for his facts. In those early days there existed a very widespread idea that a river ran north and south, dividing Asia from Europe, and in one of the earliest known maps, that of Hecatætus, drawn about 500 B.C., this river is clearly indicated.

After this truly marvellous piece of navigation we find the good ship floating on the listless Baltic so foul with weed that she could hardly move. Despair seized the crew, and their heads drooped over their oars. They could row no more, the wind

The Encouragement of Song was against them ; the end seemed very near. Then one of their number started a song, and the weary crew lifted up their heads, and, as tired sailor men have been since ships began to move upon the waters, they were heartened by the song.

They pulled her slowly along until they came to a flat shore, where they beached her and scraped her clean. Then,

strengthened by the rest, they hauled their ship over the land with ropes and rollers. For nine weary days they progressed in this back-breaking manner, until they came to another sea, upon which, with shouts of joy, they launched again. The sea was that which we now call the North Sea, and, skirting Scotland and Britain, the *Argo* drove south against foul winds and heavy seas until they came to Circe's Isle, which has been identified with the Azores.

After that they had a fair eastward wind that took them to the coast of Spain. They sailed between the Pillars of Hercules into the Mediterranean, and on past Sardinia, the Ansonian Islands, and the Italian coast, until, upon a summer evening, they sighted a fair green island in the glow of the sunset. As they rowed wearily towards it a haunting low-toned melody reached their ears. It was the land of the Sirens, whose sleepy, crooning song all but lured them to destruction.

Next they came to Trinacria the three-cornered island, which is Sicily—and steered close under the flaming cone of Etna, and through the straits between the rocks of Scylla the sea monster—and the whirlpool of Charybdis. After that they rowed for many days without seeing land, but came at length to a long, wooded island with a city by the shore, and a harbour with quays crowded with merchants and seamen. This was the land and the city of the Phœnicians. Resting there awhile they regained their strength for the final struggle with the sea a struggle which ended soon when once made. Pelion showed his head above the horizon and Aphetae, and last of all the dear, white town of Ioleos by the sea.

Such is that portion of the story of the Argonauts which deals with their adventures upon the sea. It is not included here as an accurate historical account of any particular voyage, but as a tale which shows very clearly the hardihood

The *Argo* Seeking Home

of those old navigators who, with high courage and dauntless resolution, braved the absolutely unknown.

To a Greek, Anaximander, of Miletus, is attributed the first navigating instrument. Mariners had observed that the farther north they went the higher the Pole star rose in the heavens ; and Anaximander is reputed to have invented an arrangement of two sticks hinged together, so that when one was held horizontally and the other pointed to the Pole star, the angle they made would indicate exactly how far north the observer was.

The Greeks and Romans became masters of the Mediterranean after the fourth century B.C., and the art of navigation was abandoned to some extent for the development of war tactics. There is, however, one great discovery that must be recorded to the honour of a Greek sailor during this period of great strife. Hippalus discovered that by using the monsoons in their right seasons he could sail directly from the shores of Arabia to those of India. Formerly, sailors had skirted laboriously along the shores of Persia and Beluchistan. The Greeks called the monsoons by the name of the discoverer of their use to navigators.

Neither the Greeks nor Romans, however, did much to expand the art of navigation far beyond the point to which the more entirely Mediterranean nations had taken it. They increased the size of their ships, but oars still remained the



Roger Bacon showed Brunetto a magnetised needle floating in water, but the latter declared that a mariner who used it would be accused of witchcraft.

chief means of propulsion ; and, knowing very little of the art of beating against a foul wind, they beached their craft when wind and sea became too high for oarsmanship. To the barbarous nations of the North belongs the honour of being the first real sailors. Whilst Rome was fighting for her life, the Norsemen and, later, the Jutes and Saxons were adventuring forth in their long ships, sailing more than rowing, and using every wind that blew for their purpose. Nor did they sail in fleets as the Greeks and Romans had learned to do, but went singly, gaining those qualities

of hardihood and resource which naturally made them masters of the sea. It is interesting to note that even in those days we hear of the Britons as no mean seamen.

The Britons were, however, no match for the Norsemen, who first raided all our shores and then colonised them. These hardy rovers who voyaged to Iceland, Greenland, and even to Newfoundland—steered roughly by the stars and sun, and became, as far as they could with only the most primitive of instruments, expert navigators. The Norsemen reached the zenith of their power in the eighth and ninth centuries of our era.

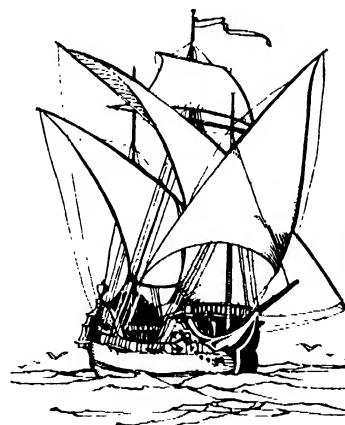
Meanwhile, during this period of expansion in the North Sea and Atlantic, navigation was dying down in the old sea of its birth until, with the fall of the Roman Empire in the fifth century, it entirely died out. After a period of quietude there was a big outburst of maritime energy on the part of the Arabs,

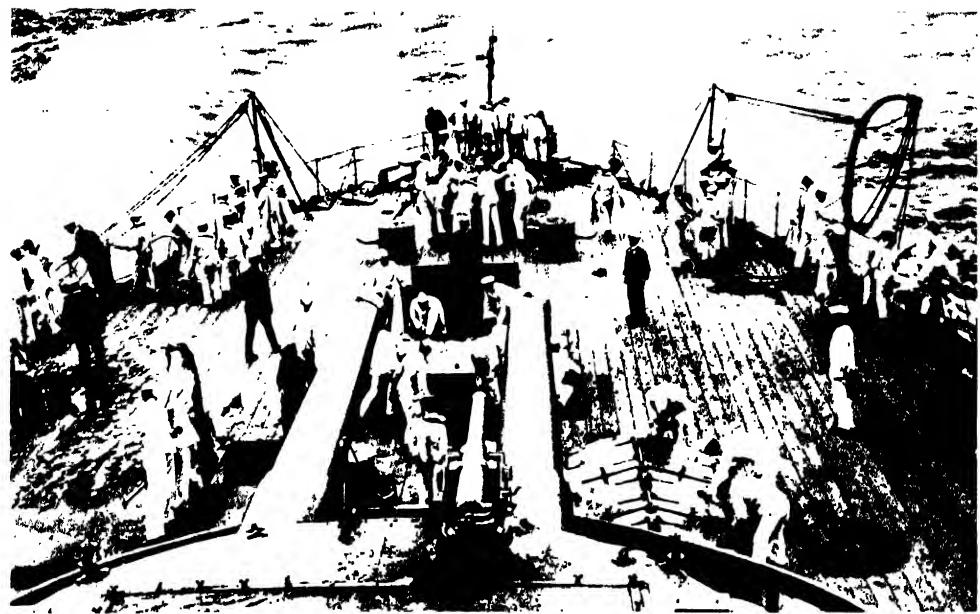
who certainly made themselves acquainted with Ceylon, Java, and Sumatra, and reached China during the ninth century. It is supposed that the pole-pointing properties of the magnet became known to the Western nations through the agency of the Arabs, though a compass was not made in a practical form until about the beginning of the fourteenth century.

Brunetto Latini, who was the tutor of the poet Dante, visited in 1258 this country's famous philosopher, Roger Bacon, who is credited with the invention of gunpowder. Bacon showed Brunetto a magnetised needle floating in a straw on a basin of water ; but the latter says, very wisely, that however useful it might be, no master mariner would dare to use it for fear of being accused of witchcraft.

With the introduction of the magnetic needle into the Western world the story of the beginnings of navigation properly closes.

E. H. R.





"Clear deck for action" is a big business, requiring the attention of "all hands."

In the Navy To-day

ALTHOUGH sail drill in the navy has been abolished, there is still plenty of work found for Jack in the daily routine of a cruiser and other ships of war, for a large amount of time is given to gunnery and other drills which have taken the place of drill aloft.

The bluejacket of to-day is much favoured, however, both in rest and food, as we will see when we compare his lot with that of his predecessors. He is allowed to remain in his hammock when in harbour till 5 a.m., whereas in former days 4 a.m. was generally the time he had to "show a leg" (this is the call generally used by the boatswain's mate to rouse out the ship's company).

As soon as he turns out at 5 a.m. each

man is given a pint of nice hot cocoa, and plenty of time to stow his hammock before he is ordered, at 5.30, to "fall in" for scrubbing decks. He is an hour at this work work, did I call it? Why, it is play to what it was a few years back. Then you had to go over the deck on your knees with a holystone in your hand rubbing on the sand until nearly the whole of the old surface of the planks was removed. No wonder many suffered with sand boils on their knees!

The scrubbing is nowadays carried out by rows of men armed with long-handled brushes. These are followed by other rows with squeegees, and a rank of swabbers brings up the rear. The water is pumped to the decks by the steam pumps, and it is sometimes quite warm. In fact, "scrubbing decks" is now much like

paddling on a beach, and is more fun than work. This fun goes on till 6.30, when the bugle sounds, "Clean guns and brass-work." Nearly an hour is taken up with this, and the sailor calls it "Spit and Polish." As there is competition between the different guns and prizes are given sometimes for the cleanest gun, Jack works with a will. It is not necessary to call his attention to any particular part, as each part of the gun and gear are allotted to one or other of the gun's crew, so that all know what is their share of the work.

At 7.30 a.m. the decks, guns, and brass-work having been brought to a polish that would do credit to a first-rate kitchen-maid, the breakfast is brought from the galley (cook-house) by the man told off as the cook of the mess or by the boy. Oh! what a difference between the breakfast now served out and that which was served

out in my youth. Why, I remember in my Channel Fleet days, in the seventies, that no sooner did the boatswain's mate put his call to his mouth to pipe breakfast than a mad rush was made for the mess, very often to find nothing there except the thin wash called cocoa then served out. What do you find now? Tea! Soft bread, butter, and a relish of cold meat or jam! Oh! shades of our fathers or of some of my old shipmates, if you could rise from your graves and see the luxuries now given for breakfast, why, you would all cry, "Oh, why was I born so soon?"

Then, again, to think this splendid breakfast is served at the aristocratic breakfast time of 8 o'clock. Very often in my bluejacket days my so-called breakfast had to be taken as soon as I turned out at 4 o'clock, and then nothing more to eat till noon.

Very well then, at 8 o'clock the boat-



Photo: Gale & Polden, Ltd.

The "handyman" is fond of all forms of physical culture, and boxing is one of his favourite recreations. A set-to between rival champions will attract a large audience.

swain's mate pipes to breakfast. From then till 8.40 is the breakfast time, during which the hands change into the dress of the day and the lower deck is cleaned and everything put in apple-pie order. At 9 a.m. the bugle sounds "Divisions," when the inspection of men takes place. For this purpose they "fall in" in long lines

The Morning Inspection and are inspected by a lieutenant, who reports the result to the Commander, who

in turn reports to the Captain. Now and again the Captain inspects the divisions personally.

After inspection the men are marched aft to the quarter-deck for prayers, those having religious objections to attend falling in on the fore-deck.

The Chaplain, or in his absence the Captain, reads the morning prayers. At 9.30 the ship's company falls in and is told off for various drills except when it is a general drill day. The general drills are those in which all or nearly all the ship's company takes part.

The first and principal of the general drills is "General Quarters," and is the clearing away of all guns and gear ready for fighting and practising the various methods of working the guns in action. In some ships that have anchors and other gear in the way of the gun fire, or if the guns are going to be fired, an evolution of preparing ship for action is first carried out before the bugle sounds to "General Quarters." During "General Quarters" several evolutions are carried out. For instance, the ammunition supply is worked, supply of spare gear is prepared and got out, preparations are made to deal with a fire caused by a shell or shells, and "Out Collision Mat" is also practised.

Next to "General Quarters" come "Man and Arm Ship." This is to resist torpedo attack. The stations for the men are based on the principle that the watch on deck man the guns, and the watch below supply the ammunition. "Out Torpedo Nets" is another general evolution that employs the whole of the ship's

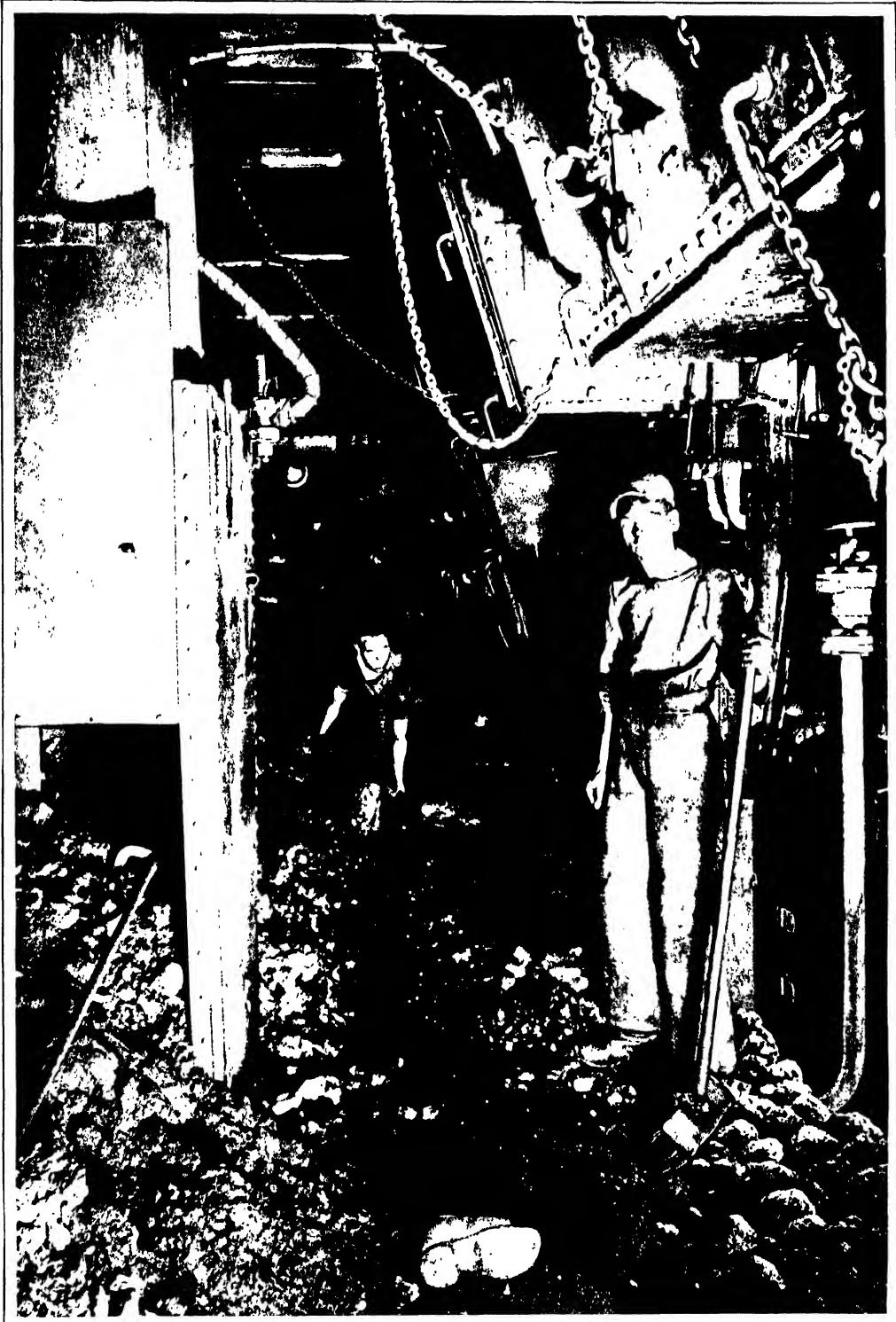
company, but only takes about one minute to carry out. I have heard that the nets of some of our ships are out in place in forty seconds.

"General Fire Station" is one of those evolutions that is sprung as a surprise. It may be carried out at any time night or day. The ship's company assemble at their stations by the rapid ringing of the bell, followed by the bugle, "Still." The boatswain's mate tells the position of the fire, and as every man knows his duties there is no confusion. Then we have "General Collision Stations." The rapid ringing of the bell, accompanied by short blasts of the fog-horn, steam syren, or "G" sounded on the bugle, are the signals used for the ship's company to go to their stations for collision or grounding. The "Still" is sounded on the bugle, and the boatswain's mate pipes the position of the injury. If it is a collision, one watch works below with the carpenter and crew to shore up bulk-head and hatches to prevent the inrushing water going further than the first compartment it has entered.

"Hands Man and Arm Boats" is another of the general evolutions that employs all hands, and in which a great deal of work is performed in a little time. All the boats are lowered; guns, ammunition, and provisions are placed in them; all the crews arm themselves with rifles and revolvers, and put their boots on ready for landing if necessary. "Hands Prepare Ship To Be Towed" is yet another of the great evolutions that is now practised, and in which nearly everyone on board has to lend a hand. Several boats have to be lowered, chain cables

How Smartness is Obtained and wire hawsers are taken to the ship that is going to tow. In this, as in many other evolutions, constant practice brings smartness and freedom from accidents. "Prepare to Take in Tow" is a fellow evolution to the last, but in this case boats are not lowered, as it is the duty of the ship that requires towing to provide the boats.

Now we come to the "Both Watches



Past, Present, Future, I.

The men who work in a naval stokehold are never clean whilst they are at work, but they are splendid fellows, and the best marine firemen in the world.

Evolutions," which, though not so important as those requiring all hands, are yet big jobs. "Both Watches Out Bower Anchor" is the chief of these, and in this

tow. "Watch Out Fire Engine" is often done for exercise, but if a fire should occur ashore or on another ship, it is soon put into practice. "Watch Work Main Der-



Under Contract with the Admiralty.

Holystoning the deck is an old method of cleaning, but is still used in some ships of the Navy.

evolution the four largest rowing boats are used—the largest to carry the anchor, the next to carry the hawser, and another to take the kedge anchor and small hawser, the remaining boat being used to tow the boat carrying the anchor. A similar evolution is "Out Stream Anchor and Cable," the only difference being the anchor is not quite so heavy and the cable is much smaller than for the bower anchor.

In all the evolutions mentioned the Commander directs, but in the following "Watch" evolutions the officer of the watch—a lieutenant is responsible for their performance:

"Watch Out Kedge Anchor" is an evolution requiring two boats, one to take the anchor and hawser, and the other to

rick": When the bugle sounds the "Incline" it is not long before the watch is seen placing the derrick ready for hoisting boats.

Although there are a hundred and one things to do on board a ship, yet time is found during a week to carry out all the above. I had nearly forgotten another of the "All Hands" evolutions, viz., "Man Ship." This is a ceremonial evolution, as it is used instead of manning yards.

If general, both watches, or watch evolutions are not to take place in the forenoon, the hands are told off for various drills—gunnery, rifle, or torpedo—and, with the exception of a few minutes' "Stand Easy," continue at their drills until 11, when the boatswain's mate



SCEPTRE

Photograph by H. T. Rouch

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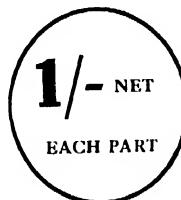
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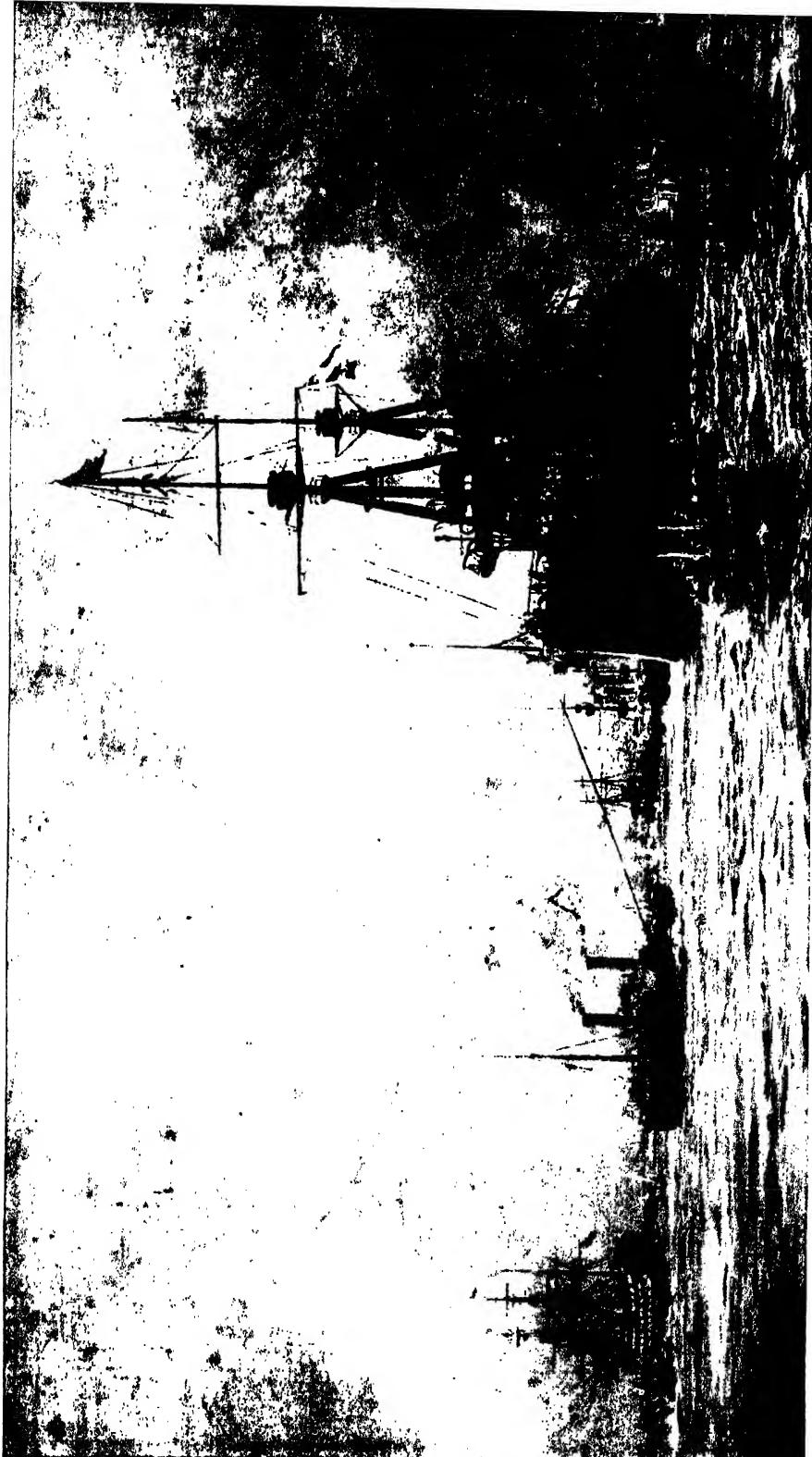
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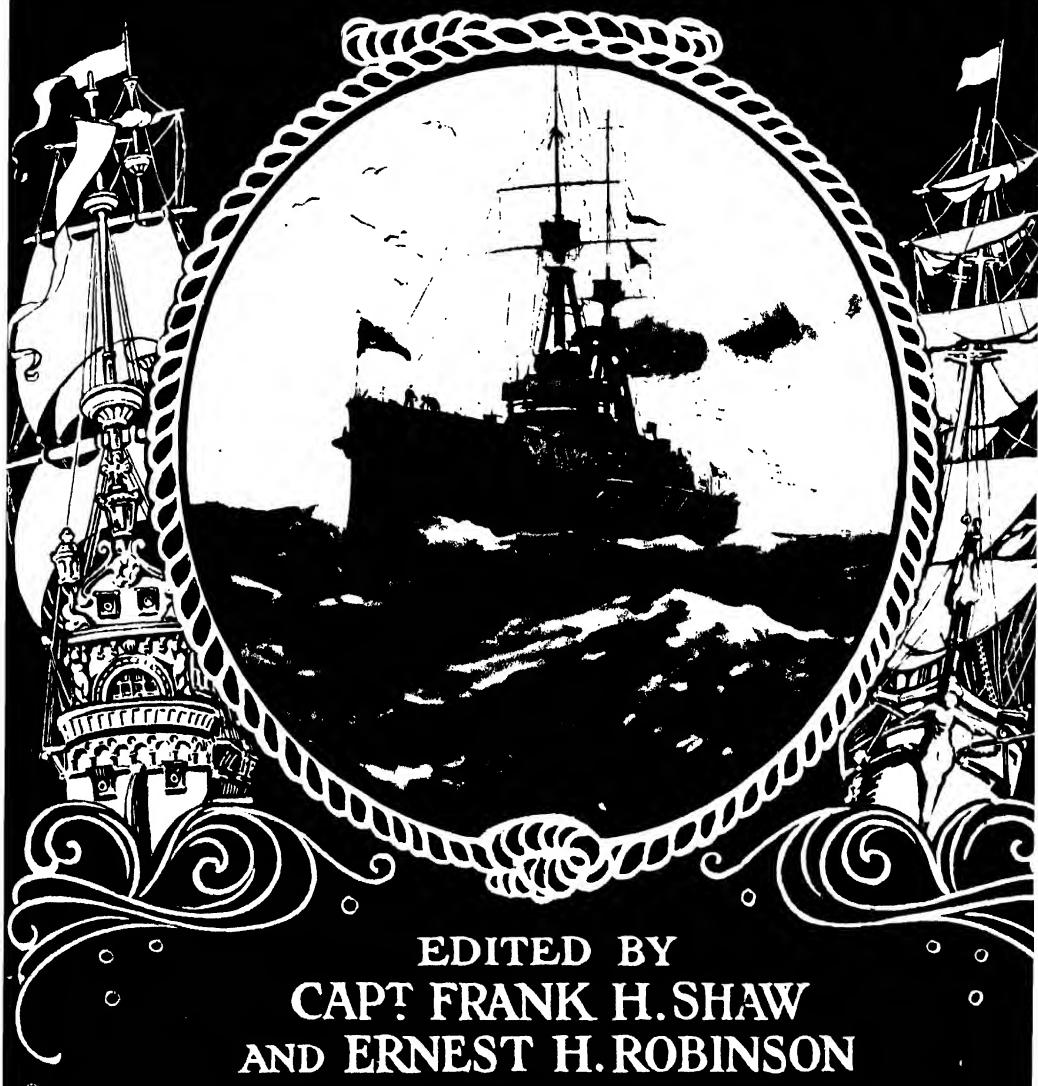
NAVY CUT CIGARETTES

H.M.S. BELLEROPHON.

Reproduced from the original painting by W. L. Wyllie, R.A.



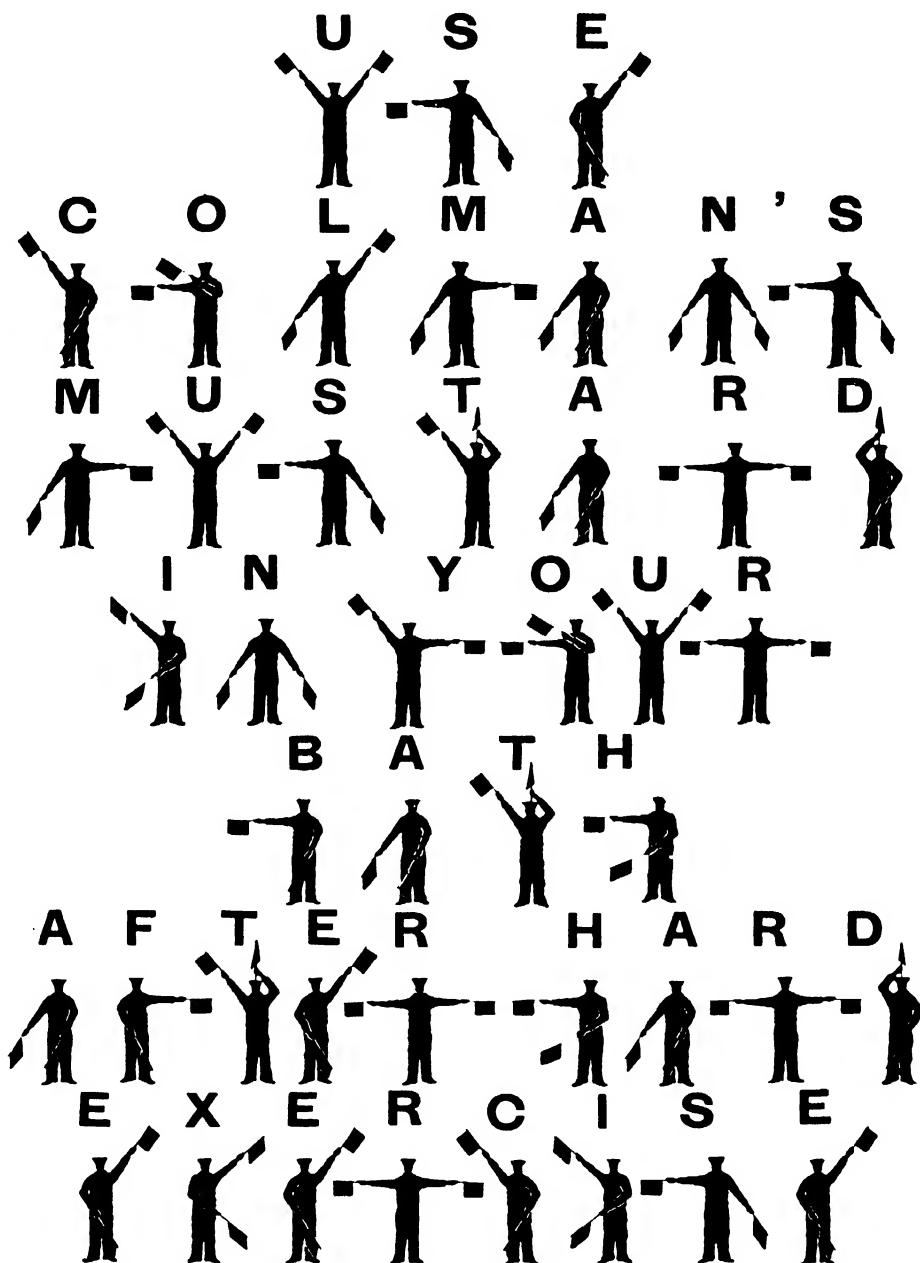
THE SEA AND ITS STORY



EDITED BY
CAPT FRANK H. SHAW
AND ERNEST H. ROBINSON

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A MESSAGE FROM THE NAVY



TO BRITISH PEOPLE!



THE LANDING OF COLUMBUS.
The Union - Local Edition

144 HEAD

pipes, "Clear Up Decks," and at noon he pipes to "Dinner." Here, again, we have a great change in the food compared with that of a few years ago. Now mutton is found in the menu, and potatoes are served out. The grog is served out during the dinner hour, as it has been for the last forty years.

At 1.15 p.m. the hands fall in again to be told off for work, and if no general or other evolutions are in the orders of the day they go to various drills until 3.30, when the drills are brought to a close and the decks cleared up before the hands go to tea at 4 p.m.

At 5 p.m. evening quarters, and sometimes a general evolution, brings the close of the day. From 5.30 till 8 o'clock the blue-jacket has the time to himself, except the little duties the watch on board has to do. The other watch go on shore if they wish when the ship is in harbour.

At 8 p.m. comes supper. Fancy, you old hands, supper! Ah! and a supper worth having, consisting, as it does, of meat, bread, butter, coffee—not mentioning the luxury of sardines and jams to be bought at the canteen. Oh! you "matlows" of the last century, compare our supply of vinegar and water, with a little biscuit dust thrown in, with this truly royal feast!

At 9 p.m. the Commander, Officer of the Decks, Master-at-Arms, and Marine Officer go the rounds to see that all naked lights are out between decks and that all is tidy. At 9.30 the day's work in harbour is done, and Jack turns into his hammock for his well-earned rest. At sea the meal times are at the same hours as in harbour. The

instructions in the various drills are carried out between 9 a.m. and 3.30 p.m., as in harbour, whilst teaching the men firing with aiming tubes and rifles at towing targets is one of the principal instructions carried out at sea.

Two evenings a week "Washing Clothes" takes place, and Thursday afternoon, called "Rope-yarn Sunday," is given over to the ship's company for making and mending. On Friday afternoon deck cloths are scrubbed, and Saturday is the general scrubbing deck day. On Sunday the decks are cleared up for inspection during the morning 9 o'clock "Divisions," or instead of "Divisions" the muster of the ship's company



Photo: G. & J. Holden, Ltd.
The butcher weighing out meat for the crew upon a man-o'-war.

called "Open List." At 10 a.m. is divine service, and at 12 dinner, after which the ship's company have the afternoon to write letters, etc.; 5 p.m., evening quarters; 9.30, turn in and dream of the future.

But these are all facts and figures. If



Photo: Gair & Padden, Ltd.

Serving out grog—a very old ceremony in the Navy.

you want to really understand the life in the navy to-day, go out with one of our warships—a destroyer for choice—whilst she is engaged on manoeuvres.

Let us consider that we are on such a destroyer, rushing through the night, hour after hour, in company with our fellows, the spindrift rattling over our rounded fo'castle and lashing our wet, cowl-encumbered deck. On our bridge a young lieutenant, scarcely out of his teens, is learning the meaning of "command" in the rough school of actual experience. He glares, with aching eyes, into the black, windy void before our bows.

Suddenly from the destroyer ahead there blinks the winking dot-and-dash of the Morse code, flashed out on a lamp, and almost before the final blink of light two of our number draw aside from our line and dash away into the darkness. They are going on an almost forlorn hope against the enemy.

"There go the lambs to the slaughter," says our skipper, laughing. "I expect they won't stand much chance: the beggars on the big ships will have their eyes well

skinned to-night. With luck they ought to bag both of 'em."

Think of it for a moment. What if it were the real thing—modern scientific war! Here we should stand watching two boats, each costing their country seventy thousand pounds, each carrying three-score brave, highly-trained young tars, full of health, driving at thirty miles an hour straight into the dread arms of the angel of Death.

That is the spirit of the navy to-day. Never mind how great the odds, if there is a chance, take it!

Anon on the far horizon a great white searchlight beams in the sky, then another and another, silently telling their own ominous tale.

Quickly enough comes our turn. In the far east gleams the first faint streaks of grey that tell of the coming of another day.

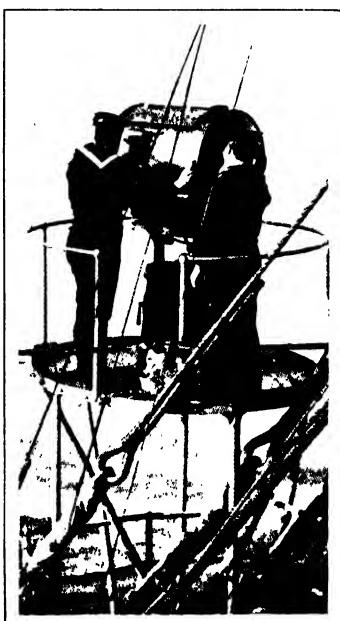


Photo: Gair & Padden, Ltd.

Cleaning one of the giant searchlights used to detect torpedo attack.

The lantern ahead splutters and dies in the darkness.

"There they are." It is a tense whisper that runs along our decks. A big cruiser, her four great funnels silhouetted against the lighter sky, is dead ahead.

The man that rules this tiny world clutches tighter his glasses and glares fixedly at his enemy. He starts and curses: a tiny spark has jumped from our after funnel and darted away on the breeze. Did they see it? The dividing line between success and failure is fine indeed.

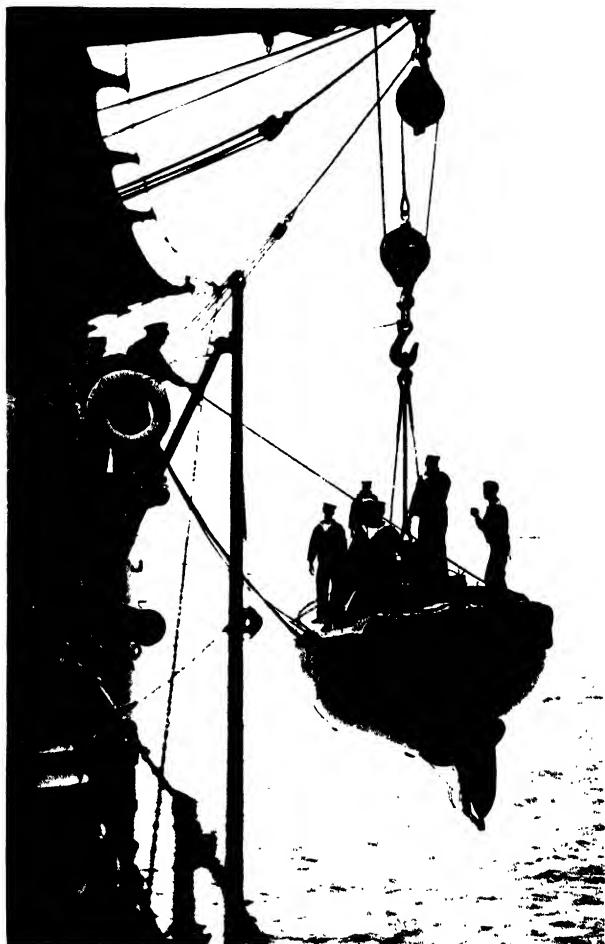
Amidship dark forms cluster round the torpedo tube; the clean-shaved, highly trained product of the Vernon (where, at a cost to the country of £300, they have been taught all there is to know of the deadly weapon) waits for the crucial moment. A bell is ringing in the steel-walled inferno below, where the artificers and stokers ply their trade, caring nothing and possibly caring nothing of what is happening above their heads—blindly confident in the man that rules them.

The vibration is tremendous, the wind whistles a high crescendo through the taut cordage, the smoke from the squat funnels tears horizontal and roaring into the chill air, the boiling wake becomes a miniature mountain of foam.

Nearer and nearer, swallowing the gaps between us and our unsuspecting foe at the speed of an express.

"Hard-a-starboard," the command comes in a crackle of words as the helm goes over. "Fire!"

There's a tiny report, a faint haze of powder smoke driving astern as the



Lifting a motor pinnace aboard by means of a derrick.

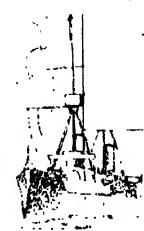
twenty-feet length of the eighteen-inch "Whitehead" torpedo dives with a mighty splash and careers away true to its mark.

High on the cruiser's superstructure a lone look-out saw the splash. On the instant the wild cry of the bugles calling her crew to "General quarters" rings out on her decks, and even as her first quick-firer commences to bark and her search-lights illuminate the sea, a tiny white fluttering calcium light carried on the nose of our torpedo is burning against her towering side, and theoretically that £500 torpedo has sent £1,000,000 in steel and seven hundred men diving deep to the ocean bed.

W. BARRETT, R.N.



The Navy as it Was



THE outstanding features of naval life in the eighteenth and early nineteenth centuries were the amount of fighting that was done and the activity of the press gang. As a matter of fact, the second was the natural outcome of the first. Mobilisation, which has now its own department at the Admiralty, was not recognised as a naval science until comparatively a few years ago, and in the old days when there was war toward a ship had to take her men where she could find them.

Consequently, the ship's officers, with a boat's crew, went to look for such seafaring men who were not either masters of merchantmen, apprentices, or first mates of sea-going ships. If the "press" was very hot and men scarce, even these protected classes were not left if they fell into the net, and landsmen, legally untouchable, were often "impressed."

The reasons for the common dislike of the navy in olden times is not far to seek. To begin with, wages in the merchant service were high and the usual voyages not long, whilst life in the navy was hard. Once on board his ship, Navy Jack never left her, except on duty, until she was paid off. To all intents the ship was a prison, with the additional chance of being drowned. As, during last

century, a king's ship was generally engaged in war, there was also the chance of being maimed or slain outright; but that, perhaps, was not considered a disadvantage, as it involved the corresponding chance of maiming or slaying some confounded Frenchman or Spaniard; and the excitement of a battle made amends for much. Setting aside these chances, a ship was not a healthy domicile. The officers fared better than the men: they had better accommodation, and sometimes better food. For the men, indeed, both accommodation and food were very bad. The ships were crowded; hygienic science was non-existent; and cleanliness imperfectly understood. A stench was commonly got rid of by making a stronger; as, for instance, by burning pitch or sulphur. The bilges were left unpurified, unventilated, and the filthy gases from them pervaded the whole ship, lowering the vitality of the men and rendering them an easy prey to sickness, even when they did not actually generate pestilence. It was only by slow degrees that efficient methods of ventilating between decks, where the men lived and slept, were introduced.

Another and very general hardship was the bad provisions. In quantity these might sometimes be sufficient to satisfy the cravings of hunger. In quality, they were always nasty, and frequently, loathsome. The staples were bis-

cuit, salt beef, salt pork, and salt fish. The biscuit, made—by the rascality of the contractors—of bad flour, became infested with maggots, known as weevils, from the name of the victualling yard at Portsmouth: half the weight of the biscuit might not improbably be made up of weevils; and to within thirty years ago,

The Bad Food of Years Ago no "old salt" would think of putting a bit of biscuit into his mouth without first

tapping it twice on the table to knock the weevils out; the action became instinctive, and would be done, quite as a matter of course, with perfectly good biscuit on a table on shore. The salt fish was very often putrid: when it was very bad it was condemned and thrown overboard, but a good deal had to be endured before that extreme measure could be adopted. Pork more frequently became rancid, and the beef dry and hard. It used to be said that snuff-boxes could be turned out of a piece of beef, and when polished might pass for mahogany. Perhaps this wasn't true; but the beef was certainly cruelly hard. It continued to be so till about forty years ago, when the hard beef and rancid pork—stores, it used to be said, from the old French war time—suddenly disappeared. The idea afloat was that the soldiers in the Crimea ate them up. If that had been so, the soldiers and the war correspondents would probably have let the world know about it; but what is very certain is, that there was a singular improvement in both beef and pork during the time of the Russian War. At times the menu was diversified, and the beef and pork, instead of being hard and rancid, were more or less rotten. When more so, they were thrown overboard, but when only less the best had to be made of them.

If circumstances permitted, fresh beef and vegetables were served out instead, and the ships' companies were "in clover." Nothing seems to have tested the abilities of our greatest commanders more than their providing for the due

supply of beef and vegetables, and so keeping their men in good health.

It was Hawke that set the example of this constant supply of fresh provisions for a fleet at sea; and some of his successors notably Nelson went still further in the same direction. When the fleet was going into action at the Nile, several of the ships had still a considerable number of live bullocks which they had brought from Syracuse. These were stalled between the guns, and had to be thrown overboard. So also in the celebrated watch off Toulon, the supply of beef and vegetables—onions, more especially was one of the first points of the admiral's care.

While the staples of the seaman's diet were in the very bad condition that has been described, it can scarcely be supposed that the accessories were much better. These were cheese, the general state of which can be imagined; butter, which was ladled out as oil, and most commonly rancid oil; peas, which went to make pea-soup; and oatmeal, which was manufactured into some sort of porridge, nautically known as "burgoo." There was no tea, no cocoa, no sugar.

The water, too, kept in wooden casks, was for the most part indescribably nasty, and the men were of necessity driven to strong drink. From the earliest times the recognised drink was beer, or, when the Bordeaux trade allowed it, "beverage" wine. The allowance of beer seems always to have been a gallon per man per day. For short voyages it answered very well; but when ships kept the sea for months

Old Time Navy Drinks
and months on end, beer was difficult to carry on account of its bulk, and difficult to keep good, by reason of the rolling of the ship. So that, when beer could not be kept good, or procured at all, and when wine was not to be obtained, spirits were issued instead. Many people have an idea that, from time immemorial, rum has been the established drink of sailors. This is quite a

mistake. Rum was served out in the West Indies ; in the East Indies, arrack ; in the Channel the substitute for beer was a "malt spirit," much the same, apparently, as what is now known as whisky, with probably a good deal of fusel oil in it. Ships leaving England for a distant voyage as, for instance, Anson's voyage

Cutting Down the Spirit Ration to the South Seas and round the world—carried brandy.

But whatever the spirit, the quantity served out to each man, at dinner-time, was half a pint, which in times of extra exposure or bad climate was increased to three-quarters of a pint. This was served out neat, and in one issue. A man might mix it with water, he might brew punch, or he might drink it off as it was. Of course, too, he might sell it, and he very often did so ; the inevitable result was that there was a great deal of drunkenness, which Vernon, in the West Indies, in 1740, materially checked by his celebrated order that the rum should be mixed with four parts of water, and should be issued twice a day, for dinner and supper. The bestial drunkenness and crime which necessarily accompanied drunkenness were immediately stopped ; though, of course, with five half-pints of strong "grog" issued to each man, but not necessarily drunk by him, there was still a vast and dangerous amount of ineptitude, which has yielded only to the cutting down the spirit ration to half a gill, and to the more liberal issue of cocoia, tea, and coffee.

What with bad, monotonous, and insufficient diet, the want of proper ventilation, the often imperfect and improperly understood sanitation, and the frequent infection brought on board by newly—"pressed" men, it is not to be wondered at that ships and squadrons and fleets were often scourged by most fearful sickness. Many diseases which on shore, where the patient can be segregated, are of little or of only personal importance, became terrible pestilences under the conditions of life on board ship.

When, in 1741, the *Neptune*, of ninety guns and 770 men, went out to the Mediterranean with the flag of Vice-Admiral Lestock on board, she buried fifty-four men on the passage and had 250 sick when she arrived at Minorea. And this does not seem to have been very exceptional. Similar instances might be quoted by the hundred. When infectious fever got on board the result was disastrous ; some form of typhus or, as it was then called, putrid, spotted, or jail-fever—was frequently very deadly, and was often mixed up with small-pox and the other diseases already referred to.

But when by extraordinary care or good luck these various sources of infection were escaped, then came scurvy—perhaps the most awful scourge of sea-faring men. The most terrible feature of this dread disease was the mystery which attached to it. Medical aid seemed useless : the surgeons could do nothing, and conjectured that it was caused by emanations from the sea, and must therefore be inseparable from sea life. This appears now the more remarkable, as they must have seen that it did not attack the officers in anything like the same proportion as the men. We know that this was because the officers were better fed (though even they fared but badly) and were better lodged. The natural ventilation of the ward-room was perfect, and the officers' cabins were, in those days, either in the ward-room, or on the gun-deck outside. It was still more remarkable, because as early as the year 1600 Sir James Lancaster knew and proved the efficiency of lime or lemon juice as a specific remedy ; but the knowledge of this, as a practical measure, was completely lost, and among the many remedies that were tried with more or less success towards the end of the eighteenth century, lime juice was one of the last. Medicine, as such, did no good. In his voyage round Cape Horn, when the surgeon had exhausted his skill, Commodore Anson served out to the sick

The Most Awful Scourge



He was seized by the press gang, and though he fought valiantly was overcome and carried on to a King's ship.

and dying men doses of Ward's "pill" and "drop." The ingredients of the "pill" are probably forgotten; the "drop" was a preparation of nitrous acid and mercury, and, like most quack drugs, never twice of the same strength.

During the West Indian campaign of 1780-82, Sir Gilbert Blane, the physician of the fleet under Rodney, was able to introduce many improvements both in diet, cleanliness, and regularity, with extremely good effect. Wine was issued instead of spirits, and when it was found that the men obtained rum from some private stills set up in St. Lucia, where the fleet principally lay, Rodney sent a party round the island, and destroyed every still on it. The result of this care was that, in the West India climate, the number of sick in the fleet was extremely small, and on April 12th, 1782, was quite insignificant; and this while the fleet in the Channel, on returning to Spithead after a few weeks' cruise, sent from 4,000 to 5,000 men to hospital.

It was Captain Cook, however, who must be accredited with the solution of the problem how to keep men free from scurvy, and indeed the right method of suppressing this plague was perhaps the greatest discovery of that great discoverer, or, to use the words of Captain Wharton, "That it should be left to a man of little education to discern the combination of means by which this enemy of long voyages could be conquered is the most remarkable thing about this remarkable man. He himself notices the disinclination of the sailor to any new

Strange Foods and Customs

article of food, especially when not particularly palatable; but he soon found means to induce them to understand that their lives greatly depended on these rather nasty messes. Sour-kraut; the unsavoury portable soups of that day; the strange greens that Cook insisted on hunting up at every land he visited, and boiling with their ordinary food; the constant washing between decks; the drying

below with stoves even in the hottest weather; the personal baths; the change of wet clothing; the airing of bedding, were all foreign and repugnant to the notions of the seamen of the day, and it required constant supervision and wise management to enforce the adoption of these odd foods and customs." To Cook, and to Cook

alone, the success was **A Tale
of
Yellow Jack** due. Wallis and

Byron, who had preceded him in the South Seas, had taken anti-scorbutics, but suffered severely from scurvy. Furneaux, who sailed with Cook in the second voyage, and under precisely similar circumstances, had scurvy on board his ship the *Adventure*, while Cook in the *Resolution* had a clean bill of health. It was only in Cook's ships, and in the *Discovery*, commanded and officered by men who had sailed with him and seen his methods, that exemption occurred.

But though, owing to better food and housing, officers in the navy suffered much less from disease than did the men, there were some maladies notably the Yellow Jack that seemed to pay no respect to rank. Here is an instance of rapid promotion in consequence. One day, during the French wars, a certain William Quiller happened to be in Plymouth without his "protection." An officer of the press gang there, seeing that he was a strong and well-built man, gave orders to seize him, and in spite of his struggles he was soon haled on board a frigate just on the point of sailing for Jamaica. Shortly after setting sail the names of the crew were called over, to which each man answered, but on Quiller's name being called he was ordered to stand aside. Captain Whitter, who commanded the frigate, then put some questions to him, and, finding him to be the son of an old friend, appointed him to the quarterdeck, where he soon displayed uncommon smartness and ability. At Jamaica the ship was attacked by yellow fever, then raging in the island, and by the time the vessel completed her

stay there all the superior officers, including the captain, had either died or been invalided home, thus leaving William Quiller in command of the frigate, after having been on board her only twenty

brutal discipline that prevailed. Jack is no longer whipped and pickled, but is protected by Act of Parliament (or, rather, many Acts), and seems none the worse for it. But his back suffered cruelly in the



The excitement of a battle made amends for much that was unpleasant in the lives of the old-time sailors.

months. He then proceeded to bring her home, which he accomplished in safety.

The number of men drafted in from jails and dens of iniquity in the larger towns not only accounts for the jail-fever and many other diseases on board our ships, but also explains the common severity of punishments and the almost

"good old times." In the spacious time of great Elizabeth, Robert, Earl of Essex, drew up certain instructions and delivered them to the Lord High Admiral to be read twice a week to the crews of ships after Divine service. Profane language, brawling, and dicing were to be put down, and "picking and stealing you shall

severely punish ; and if the fault be great, you shall acquaint us therewith, that martial law shall be inflicted upon the offenders." But what were the punishments that captains could inflict ? Monson tells us : " A captain may punish according to the offences committed, viz., putting one in the bilboes during pleasure, keep them fasting, duck them at the yard-arm, or haul them from yard-arm to yard-arm under the ship's keel, or make them fast to the capstan and whip them there, or at the capstan or main-mast hang weights about their necks, or to gag and scrape their tongues for blasphemy or swearing. This will tame the most rude and savage people in the world."

So keel-hauling, if it be an invention of the Dutch (as is commonly supposed), must have been a very early one. The Dutch, at any rate, were masters of the art. Every reader of naval stories knows what keel-hauling is. A man is dragged under the ship's bottom and up again, his back flogged with the barnacles, until it is certain that one more dip will settle him. In Roggewein's " Voyages " we find a refinement of this method of torture. A man, filled with drink, had high words with the cook, and finally, losing all control, stabbed himself. He was carefully tended until his wounds were healed. As soon as he was strong enough he was brought forward and, his crime being declared, he was keel-hauled three times ; then received three hundred lashes. After this his right hand was pinned to the mast with his own knife. Not content with this, the captain kept

"Keel-hauling" him chained to the fo'castle, meaning to set him ashore on the **Brutality** first desolate island

they came across. Such an island was found off the Brazilian coast, and there the poor wretch was carried and left to starve to death.

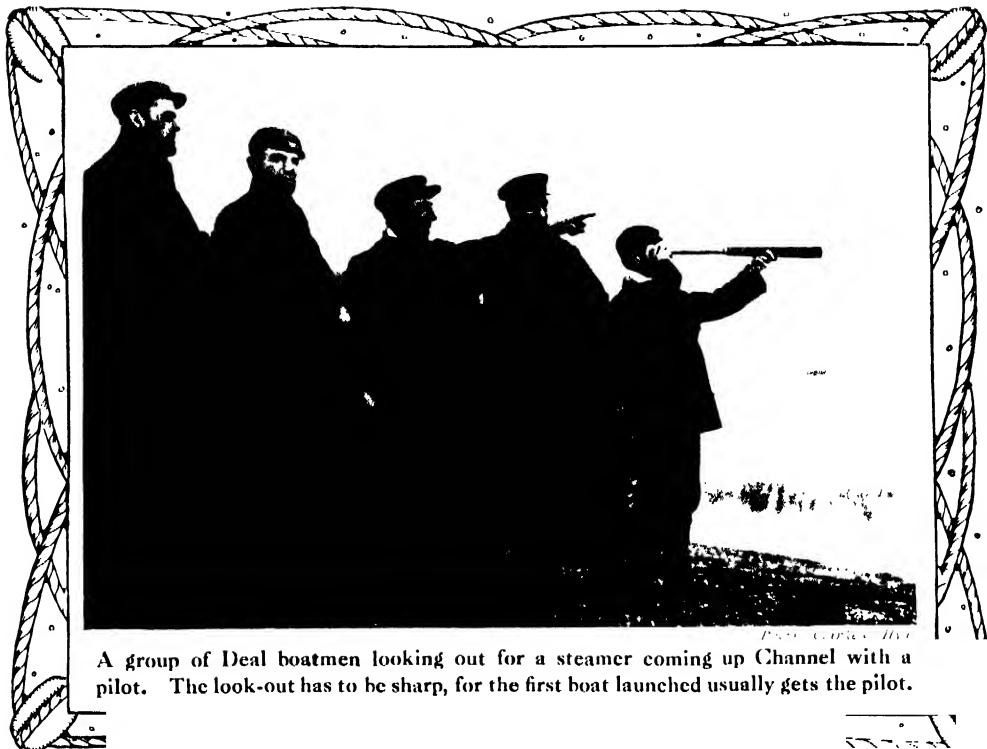
Flogging, of course, was the commonest punishment in the navy. It was often ferocious, and often dealt out for offences that would have been amply punished

by stoppage of the day's grog. Five hundred lashes was not at all an unheard-of punishment, and the " cat " itself was a terrible instrument of torture. " I would not," says Dr. Stables, a surgeon of the Royal Navy, " use it on a bull unless in self-defence ; the shaft is about a foot and a half long, and covered with green or red baize, according to taste ; in the thongs are nine, about twenty - eight

The "Cat" in the Navy

inches in length, of the thickness of a goose-quill, and with two knots in each. Men describe the first blow as like a shower of molten lead." We need not go into a description of the scene old naval literature is full of such pictures—of the ship's company gathered in the waist and gangways, the officers on the quarter-deck, the culprit lashed to a grating against the bulwark, with another grating under him, the small cup of water to help him through with the torture, the boatswain combing out the thongs with his five fingers, and the boatswain's mates standing by with fresh " cats " in canvas bags. Perhaps the worst of the business was the captain's irresponsibility with regard to the number of lashes. A vindictive man might go on ordering dozen after dozen, and only the surgeon could warn him to stop.

They used to hang Jack, too, on a very small provocation—from the yard-arm as the bow-gun fired, and while the yellow flag flew at the mast-head for the admiral's ship. This was, of course, a natural punishment for mutiny ; but there were some among our captains, and among the best of them, who were chary of extreme severity even when mutiny threatened. While Sir James Saumarez commanded a squadron off the coast of Spain a spirit of mutiny broke out, and one of the ring-leaders a ship's carpenter and a good seaman was tried for his life. Saumarez sent for him, made a noble appeal to his better feelings, and dismissed him a loyal man, who afterwards did good service for his country in the battle of the Nile.



A group of Deal boatmen looking out for a steamer coming up Channel with a pilot. The look-out has to be sharp, for the first boat launched usually gets the pilot.



OH, pilot, do please put your right leg over the rail first," cries an excitable lady. "I've a bet that you will."

"Madam," says the brown-bearded, sea- and sun-tanned man, with a twinkle in his eye, "you take an unfair advantage." And he immediately puts both legs over the ship's rail at once.

That, perhaps, is the keynote of the pilot's character: fairness. He is thrown in contact with master-mariners, and grows to love them. It would possibly be his desire to help them in sundry matters, but loyalty to the shipowners forbids. Therefore, he steers as clean a

course between employers and shipmasters as he steers from the open sea to the intricacies of the river which he knows as a London journalist knows Fleet Street.

He is the last connecting link with home, for long after the fussy tugboats have cast off their hawsers, shrilled farewell on their whistles and sped away into the gathering dusk to seek fresh spoil, the clear-eyed man remains aboard the outward-bounder, until the last point of danger is safely past, and the way lies clear to the open sea. Then the white-edged Jack is flown from the fore; some trivial cable comes flashing along from nowhere, letters are hurriedly sealed and stamped, handed to the pilot,

to be stowed in a capacious pocket ; he wrings the hands of the captain and officers, bellows out something to the man in the waiting boat, disappears down a clattering, shaky ladder, and the last you see of him is a waving hand protruding from a smother of foam. You have dropped the pilot, and you feel as if you had lost a friend.

The Life of a Pilot His is an interesting life. There are few, perhaps, more interesting. A life full

of danger and responsibility ; with every sense continually on the alert ; with a mind constantly engaged in nautical problems, with a heart that is bold enough to take risks when the risks are necessary to catch a tide or gain a market. He faces weather that would appal the stoutest-hearted landsman, and faces it in a cranky dinghy or a ratcheting lugger ; he knows as much about handling a ship as any past master ; he knows as much about the bottom of the sea as he knows of its top ; the lights that fringe the shore, and which to the uninitiated are simply welcoming eyes, have each their exact meaning to him ; and he will steer your ten-thousand ton steamer through fog from the Start to Gravesend, or from Queenstown to Liverpool, and never make the smallest error in judgment, or shut an eye until the work is done. That is a pilot—a man who knows a little of everything pertaining to the sea and the ships upon it, and who knows a lot about the land ; especially that part of the land which fronts the tides and surges of old ocean.

He has received a thorough training in his work, for he started very young. The man I have in mind, as fine a specimen of his species as I have ever seen, was first a boy—general whipping-post and scullion aboard a fishing boat. Here he learnt to understand the sea and to love it, to love it in all its varied phases, but principally when it was lashed into fury by the winter gales. He grew used to exposure and constant drenchings : he came to look on sleeping in wet garments

and turning out, shivering and hungry, to cope with sudden, unexpected emergencies as part of his existence.

He learnt how to do with a minimum of sleep and a maximum of work, and this elementary knowledge stood him in good stead later, when the Honourable Corporation of Trinity House considered his application to commence life as a pilot apprentice favourably. He had to pay a small premium for this favour, but he knew then that before him spread many opportunities.

It took seven years of arduous training before he was considered qualified to pilot the smallest sea-going vessel into port. During the seven years he was wrecked twice ; once when the cutter in which he had his being was cut down by a clumsy-handled tramp, and again when she was blown ashore on reefs in a raging hurricane that is still spoken of with awe amongst the sea-faring fraternity.

He, in company with another lad of his own age, had to man the little punt when the cutter ratched up to windward of a motionless steamer or sailing-vessel, at whose fore-mast flew the Pilot Jack, and, no matter what the weather was like, had to take that trivial punt through the surges and spindrift, had to ship their oars deftly and catch the thrown rope which as often as not struck him painfully over the head ; and had to grapple the foot of the rope ladder and hold it steady until the much-clothed pilot scrambled aboard, as often as not with a grunted curse his only thanks.

This done, he had to take the punt back through the rough water and bring her alongside the parent craft, avoiding damage so far as in him lay, for the skipper of the cutter was a harsh man, with no love for boys.

But this rough work gave him valuable experience in the handling of boats in a seaway, and since ships are but boats of a larger growth he gradually grew to understand exactly why his seniors did

A Rough School

this and that when they wanted the ship they had charge of to tack or wear. He spent long hours in studying the coastwise lights, until each one gave up its secrets, and he knew that to bring a certain red light in line with an occulting white light, and bearing a certain

ship he was aboard to give place to another vessel, and when it was correct procedure to hold on steadfastly.

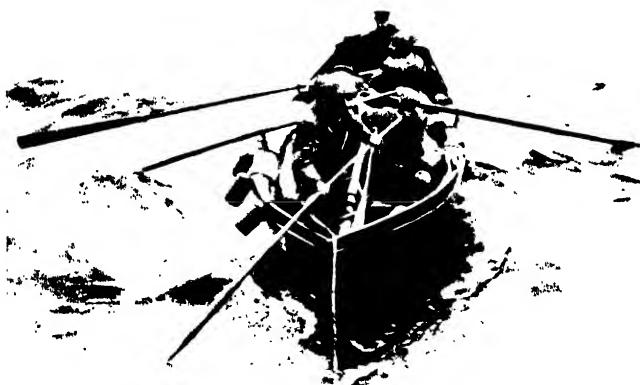
After this it became a regular custom for him to accompany one or other of the pilots when they went on board the big ships, and every trip added to his store of

learning. The frequent fogs that occurred cultivated his sense of hearing, and he grew to be able to distinguish cleverly between the bull-like roar of the Inner Sand-head foghorn and the plaintive wail



way, meant that before the ship's bow lay a smooth channel free from dangers. But as he knew that eyes are merely secondary considerations to a pilot he cultivated his sense of smell and hearing.

One day he was allowed to accompany a pilot aboard a homeward-bounder. He played a very insignificant part, being appointed helmsman indeed, but he studied each course he steered, and made mental notes of the exact bearings of headlands and beacons whenever the course was altered. In this way he began to know the intricacies of the channels, and, more than that, the still greater intricacies of ship-handling. He had studied the rule of the road carefully, and knew just when it was the duty of the



Pilot's Cap and Glasses.
The top picture shows the landing in a heavy sea of the hardy men who take the Channel pilots to and from Deal. The bottom photograph is of the pilot just leaving a vessel.

of the Lower Mouse. For he knew that there would be times when it was necessary to get the ship he piloted into port irrespective of such delays as fogs and gales, and after the lapse of a few years he found that he could trace a sure course from sea to dock simply by the sounds he heard.

Then he had to study the tides, and to know just what effect a strong wind

would have on a ship making to cross the tail of a certain sandbank of evil omen. There were places where full flood meant safety and half flood death- and the tides were constantly changing, but he added to his lore daily, and all he learnt was stowed away at the back of his receptive mind.

One day he reached a point that showed him what he had worked for. He went aboard a sailing vessel with a senior pilot, and the pilot went below, leaving him in sole charge. Now was the time to test his theoretical workings. He gave a command for the first time, and had it obeyed. The second mate walked to his side and called him "Pilot." He had arrived!

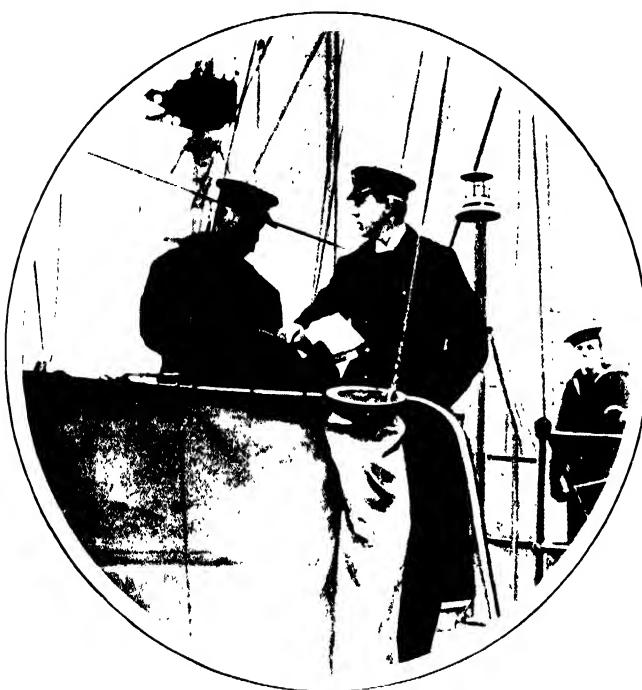
wards as to what he knew about the approaches to the port he was to be licensed for. He answered every question without hesitation, and after some delays he was handed the certificate that made him a third-class pilot. He was thus able to take vessels below a certain tonnage into port on his own account ; and he told me that he will never forget the awful sense of helplessness that came to him when the cutter's boat landed him drenched and alone, on the deck of a barquentine, and he realised that on his shoulders rested the responsibility for that barquentine's safe arrival in port.

In course of time he was made a second-class pilot, and then a first-class man.

After this he had nothing to do save to take his place in the cutter's cabin, and his turn at duty when the blue lights flared over the sea in signal for his services. He had very many adventures ; once he dragged the ship off a quicksand so closely that her propellers stuck in the viscous mass for an appreciable minute ; but the reason he was so close to danger was because a new channel had affected the tides, and he had received no warning that the new channel was opened.

But as he grew older my pilot sought about him for greater comforts. The constant tossing in the little cutter was proving irksome, the long drenchings were

awakening rheumatism in his bones ; he applied for a post as special pilot to a great shipping line and got it. Then he had reached the height of his ambition. He received a fixed yearly income, and had regular routine work.



A pilot on the Admiral's bridge of a battleship giving the captain the state of the tides. Note how the latter is looking towards the harbour.

Then he passed an examination ; he was brought before a board of shipmasters and senior pilots, and closely questioned, first as to his knowledge of navigation and seamanship, next as to the machinations of the mariner's compass, and after-



Photo: Stephen Cribb.

The naval signaller is called by his mates a "bunting tosser." Here some are shown hard at work hoisting signal flags from the bridge of a battleship.

Flags at Sea

TO speak of flags is to open one of the most romantic chapters in the history of Ocean Empire. Indeed, the bunting flutters through all the story: sometimes at the trucks of two tall ships in action, when we wait breathlessly to see which shall be first hauled down; sometimes at the mizzen peak of an old ship of discovery, blown in tatters by the arctic wind, or drooping under tropical suns; sometimes as the pirate's dismal emblem, a black rag with skull and crossbones.

The landsman is apt to look upon a flag simply as an ornament, or, at most, as a pretty distinctive sign, with about as much significance as a bunch of ribbon in a recruiting sergeant's cap. As a matter of fact, to those who understand them, flags have a tale to tell, and

to those who also know our naval history, a deeply interesting tale.

Take the case of "the meteor flag of England"—the Union Jack. There are many people, no doubt, who, if they have ever given the subject a thought, imagine that some clever or distinguished person took it into his head one day that Great Britain wanted a flag, and promptly designed one. As a matter of fact, the Union Jack was no more built in a day than Rome or the British Empire.

The flag of England down to the year 1606 was the St. George's Jack. St. George is, as everyone knows, the Patron Saint of England, and the shield of St. George gave England her flag a red cross upon a white ground.

This was the flag under which our forefathers defeated the Spanish Armada, and won our earlier successes; and they were as jealous of its honour as ever

we can be of the Union Jack's, though they were inclined to be more blustering and bullying about it than we are. In those days the foreigner who refused to dip his flag to the St. George's Jack, thereby acknowledging England's sovereignty of the sea, was apt to find himself somewhat rudely called to order. In the year 1554,

Honours for the Flag in Queen Mary's reign, Lord William Howard was sent with a fleet

of twenty-eight sail to escort Philip of Spain up the Channel. Prince Philip was accompanied by 160 of his own ships: and the Spanish Admiral came along very proudly with the Spanish flag flying at the main-top-mast-head. He was probably surprised to find himself greeted with a good round shot by Lord William Howard, who flatly refused to give the Prince any other welcome till the Spanish colours were hauled down. It was shoot first and explain afterwards in those days, as a dozen such incidents show.

With the accession of James I. and the union of the crowns of England and Scotland, the national flag was altered to give Scotland a share in it. The Patron Saint of Scotland is St. Andrew, and the Scottish flag was blue with a white St. Andrew's cross. To put a stop to all squabbles about the precedence of the rival banners of St. George and St. Andrew, the Union Jack, as it was then called, was made by blending the two, or rather by super-imposing a red cross with a white border on the Scottish flag. The white border is the remains of the white ground of the old flag of St. George.

It was in the year 1606 that James I. ordered this flag to be used; and the suggestion is that it took its name from James (Jacques), and so was "Jacques Union," or "the Union of Jacques," very easily shortened into "Union Jack."

When England and Scotland were finally united in 1707 it was formally declared the "Ensign Armorial of the United Kingdom of Great Britain."

Under this Union Jack, Blake fought,

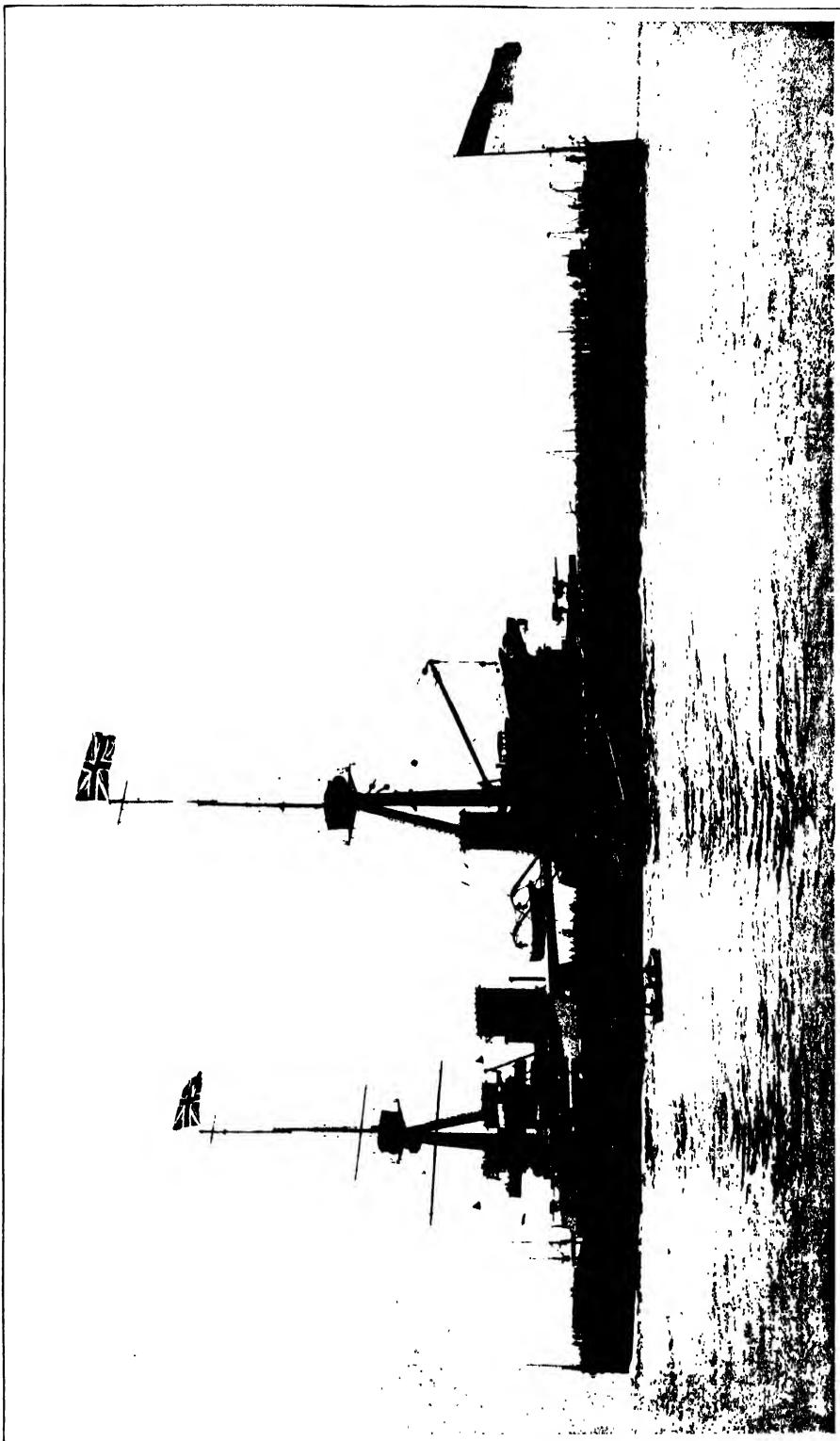
and Monk, and Ascue, and Rodney, and Benbow, and all the naval heroes who adorned the close of the eighteenth century; but it was not the Union Jack that we know. Our present Jack first came into use on January 1st, 1801, when the Union with Ireland was concluded. A place on the flag had then to be found for a red diagonal cross sometimes, though erroneously, called St. Patrick's Cross. St. Patrick had no cross: and the saltire that goes by his name really came from the arms of the Fitzgerald family—even as the American "Stars and Stripes" were adopted from the shield of the Washingtons. This new red cross was placed upon the white St. Andrew's Cross, leaving a margin of white on either side, and so our modern Union Jack was reached.

It is not very easy to make or draw this flag correctly. The red diagonal cross does not come exactly into the corners of the red St. George's Cross; and the white margin of this red diagonal cross is twice as wide on one side as on the other. Amateurs, and most foreigners, almost always fail to notice this, and their imitations are easily detected by the expert eye. More than once during our wars a foreigner attempting to sail under false colours has failed because her captain had not taken sufficient care to make his Union Jack convincing.

Though the Union Jack is the national flag of Britain it is not, in its simple form, our sea flag. Its usual place on a man-of-war is on the "jack staff," a short mast at the bow of the vessel, and merchantmen are not allowed,

Who May Fly the Union Jack?

under a heavy penalty, to fly it at all, save with a white border all round it, when it signifies, hoisted at the fore, "I want a pilot." Our sea flag is the ensign which is either a white, blue or a red flag, having the Union Jack in the "canton," or top corner next the staff. The white ensign has, in addition to the Jack, the red St. George's cross; and is, indeed, the old St. George's



This photograph is of deep interest in that it shows H.M.S. *Inflexible* flying the two Union Jacks that signify she has on board an Admiral of the Fleet. This is the first time a British ship has flown an Admiral of the Fleet's flag within the memory of living man.

Jack, the first national flag of England, with the Union Jack in the corner.

The White Ensign is the flag of the Royal Navy, and is usually flown on the ensign staff at the stern of the vessel.

In the old days all three ensigns were found in the navy. There were then nine orders or degrees of Admirals. When

**Flags of
the
Admirals** a captain was promoted to flag rank, he first of all became a Rear-Admiral of the

Blue. His next step was Vice-Admiral of the Blue, then Admiral of the Blue. After that came Rear-Admiral, Vice-Admiral, and Admiral of the Red; and then Rear-Admiral, Vice-Admiral, and Admiral of the White, which was the very highest rank of all.

At that time all the ships of a fleet or squadron flew the colour of the Admiral in command, and his rank—whether Rear-Admiral, Vice-Admiral, or Admiral could be known by the mast at which the flag flew.

A Vice-Admiral's flag was hoisted at the fore; an Admiral's at the main; and a Rear-Admiral's at the mizzen. And so, to give an instance or two, if an Admiral of the White were in command, a white ensign would be flying at the main truck; if a Vice-Admiral of the Red, a red ensign at the fore. If a council of war was to be held, an Admiral would hang his flag in the main shrouds; a Vice-Admiral in the fore shrouds; and a Rear-Admiral in the mizzen shrouds.

These distinctions of the White, Red, and Blue have been done away with. To-day there are only three ranks of Admirals—Rear-Admirals, Vice-Admirals, and Admirals, with a more or less ornamental distinction that ranks above all—that of Admiral of the Fleet. Of Admirals of the Fleet there are only seven or eight, the King being one and the German Emperor another. An Admiral of the Fleet flies a Union Jack at the main; an Admiral a St. George's Cross at the main; a Vice-Admiral the same flag with a distinguishing red ball in

the near upper corner, at the fore; and a Rear-Admiral the same flag at the mizzen, but with *two* red balls.

The Red Ensign is the flag of our magnificent mercantile marine, and is to be seen in every part of the world. As has been previously hinted it is the only flag indicative of nationality permitted to be shown by a British merchantman.

The Blue Ensign is the flag flown by Colonial men-of-war, the seal or badge of the colony being displayed in the "fly" or outer part of the ensign. A Colonial war vessel uses with the Blue Ensign a blue streamer or pennant. Besides this the Blue Ensign with a distinctive badge on the fly is used by all official vessels, such as transports, etc., at home and abroad.

The Blue Ensign without any distinctive sign may be flown by a merchant vessel commanded by a retired naval officer or an officer of the Royal Naval reserve, provided that ten of the officers and men of the crew belong to the Royal Naval reserve.

The Royal Standard has the same significance at sea as it has on land, and denotes the presence on a vessel of a member of the Royal Family, the particular member of the Royal Family it honours being denoted by the label that runs across the top of the flag.

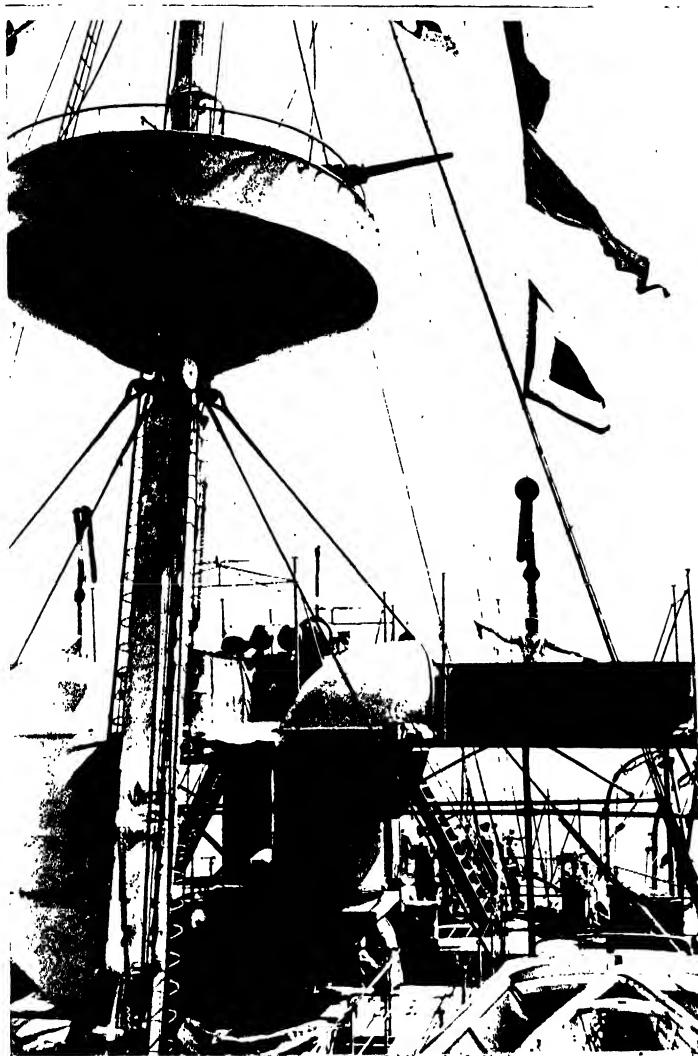
The "honour of the flag" has ever been dear to our nation, and by the phrase is meant the absolute supremacy of that flag in both high and narrow seas. The Sovereignty of the Sea was first claimed for England by King

**The
Sovereignty
of the Sea**

In the second year of his reign that monarch sat down at Hastings and decreed, with the assent of his peers, that "if the governor or commander of the king's navie in his expeditions shall meet any ship whatsoever by sea, either laden or empty, that shall refuse to strike their sails at the command of the king's governor or admiral, or his lieutenant, but

make resistance against them which belong to his fleet ; that then they are to bee reputed enemies if they may bee taken, yea, and their ships and goods confis-

credit that he pluckily fitted out 500 ships under the Earl of Salisbury, in the year 1213, to do battle against a fleet twice that size with which Philip of France



This photograph of a signal flying on H.M.S. *Highflyer* will give some idea of the difficulties of reading the flags when the wind is whipping them about.

cated." And there is no doubt that King John meant what he said. This king, perhaps the ablest of all the Angevins, occupies a pretty black page in English history : let it be remembered to his

intended the invasion of England. In the result the English completely broke their enemies, taking 300 sail and driving more than 100 ashore ; while Philip had to destroy the unhappy

remainder to prevent them falling into English hands.

The dominion of the sea was stoutly maintained by our Edwards and Henrys. We may find testimony to this pretension in the gold-rose noble coined by Edward III. The stamp on this coin represents a ship afloat, and an armed king sitting in it as upon a throne. The temper of those times may be illustrated by the following incident. In the reign of Edward I. an English sailor happened to be killed in a brawl in a Norman port. Immediately, and in the most lighthearted

duel actually took place on April 14th, 1293, when the English won and towed off in triumph 250 of the enemy's vessels.

From then for nearly four hundred years onward our navy was usually engaged in enforcing on Hollander, Frenchman, or Spaniard our splendidly arrogant demand that every vessel upon whatever waters should lower either topsails or flag to our flag, whilst we "refused to strike to the subjects of any king or state in the world."

In 1667 that fine old sea-dog of Holland, De Ruyter, a worthy foeman for

the best of our admirals, made one last protest. He sailed up the Thames into the Medway, and burnt our shipping right and left. Had he known it he might have gone even further than he did and have subdued London, putting an end, once and for all, to the possibility of Britain claiming the title of "Mistress of the Seas." Luckily, however, De Ruyter did not know our weakness, and sailed away. This was the last kick of the Hollanders. In 1674 the English sovereignty was defined and acknowledged and remained supreme, though not



A naval signalman using the semaphore system of flag talking to communicate with another vessel.

manner, England declared war against France, and the two nations agreed to settle the dispute on a certain day with the whole of their naval forces. The spot of battle was to be the middle of the Channel, marked out by anchoring there an empty ship. And this strange

unchallenged by other nations, until a comparatively few years ago, when a board of arbitration sitting in Paris decreed that every nation has a free right to the sea.

"Pomp and circumstance" is by no means the beginning and end of the use of the flag at sea. Even in these days

of the wireless telegraph most of the conversation between ships at sea is carried on by means of flags or their equivalent.

The signal which appeals most to the landsman is probably the Ensign hoisted upside down. This is recognised by all ships as a sign of distress, but it is not official. There is a special signal "N.C." in the International Code for making a sign of distress.

If a ship flies her flag at half-mast it is a sign of death. In France, Italy, and other Roman Catholic countries every vessel, large and small, carries her flag at half-mast on Good Friday. A merchant ship may be known to be in mourning, too, if the line below her bulwarks be painted blue instead of the more common white or yellow.

But for all intricate conversation a code of signals must be used. There used to be a number of these codes, the most ingenious perhaps being that invented by no less a man than the author of "*Peter Simple*." But Marryat's Code, with all the others, has given way to what is now known as the International Code, originally published in 1857 and revised in 1901. At first this was known as the Commercial Code; but now that it has been adopted by all civilised nations for their imperial as well as their mercantile navies, the more comprehensive title fairly belongs to it.



Photo: Stephen Cribb
A curious flag, known as the "Paying-off Pennant," is flown by vessels of the Royal Navy when paying off, and is a yard long for every year the ship has been in commission.

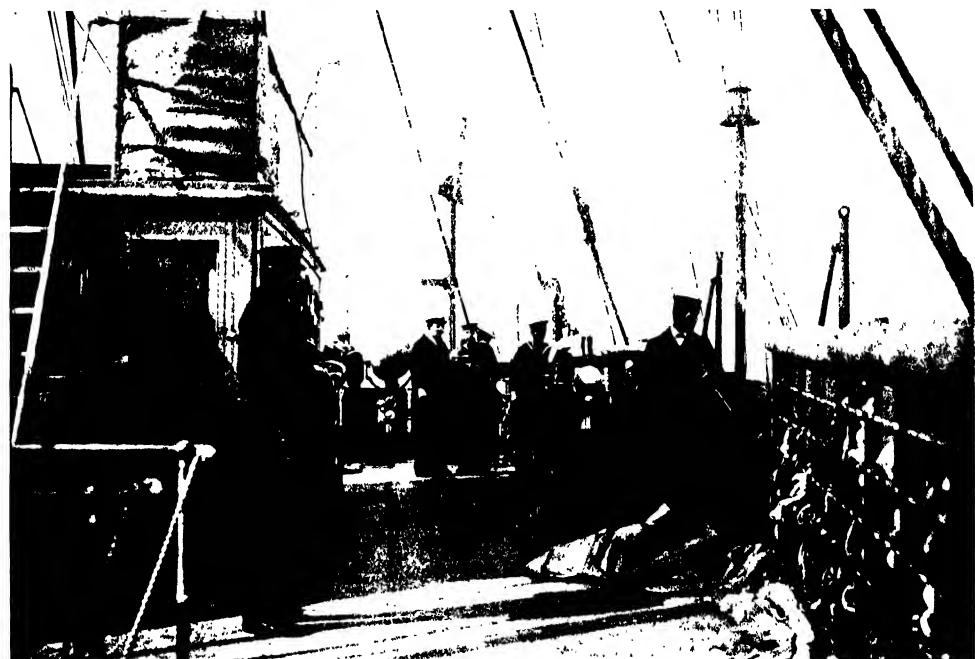
Of course, all imperial navies have their own private codes as well for their own private use; and the greatest care is taken, by frequently changing these, to keep them unintelligible to other nations. But for ordinary purposes they use the International Code.

At the signal stations set up around our coasts and in very many places on every seaboard, for the purpose of reporting ships, etc., no notice is taken of any signal not given by this code. Translations of it have been made into every important

language ; and the code itself has been so arranged that when, from distance or haze, colours cannot be distinguished easily, it may nevertheless be used under the form

three flags in this instance doing duty for twenty-three.

Most conversations at sea are carried on in this shortened form, for by it, so



The signalling bridge of H.M.S. *Queen*, showing the lockers in which the flags are always kept in perfect order, so that they are instantly to hand when wanted.

of Distance Signals (drum, cone and ball) or by means of a Semaphoric system.

In the International Code there are twenty-seven flags, giving one for each letter of the alphabet, and a code flag or answering pennant. Two of these are burgees, or swallow-tail flags, six are pennant or triangular flags, and nineteen are square flags.

With these flags messages can be spelt out, not more than four flags being hoisted at a time ; but this is not usually done, for the code itself allows of a very quick method of sending almost every message likely to be required at sea. For instance, on being asked what direction another vessel was heading when last seen the vessel signalled to might answer A R X, meaning North-east-by-east-half-east,

ingenious is the code, ships of nations speaking totally different languages can talk. All the European maritime countries, as well as Japan, Turkey, Siam, Tunis, Brazil and some others, have accepted the code.

The method of talking on the high seas by means of the International Code is extremely simple. We will suppose that the British ship *Letchmere* is passing another ship. She has nothing particular to communicate but desires to pass the "time o' day" so to speak. Directly she gets within reasonable distance she hoists her Red Ensign with the Code Pennant under it. Upon the other ship up goes, say, the red-white-and-green mercantile ensign of Austria, also over the Code Pennant. The code flag is then

hauled down on the *Letchmere*, who spells out her name. The Austrian does the same. They then exchange port of origin, where bound for, and longitude by chronometer and so part, each dipping her ensign - that is, lowering it a short distance from the masthead and hauling it home again. The Code signals are clearly arranged so that very urgent and important signals only necessitate the hoisting of two flags. For instance, A C signifies, "Do not abandon the vessel"; U D means "Report me by telegraph to Lloyds"; and Z U is read, "Have you seen or heard of a vessel wrecked or in distress?"

The Code Flag or Answering Pennant they are identical is hauled home to its fullest height by the vessel being signalled to after every hoist that is understood; if it is not understood the Answering Pennant remains at the "dip."

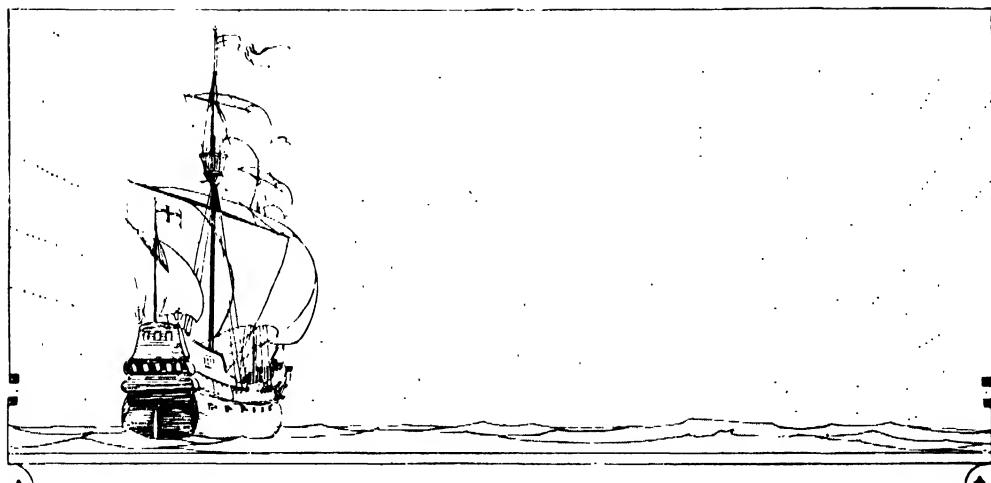
Used by themselves a number of the flags of the Code have special significance. For instance, the blue and white burgee, which means A in the code, is always flown by vessels of the navy when making full speed trials as a warning of their urgent need for room.

The yellow and black flag "I," is an ominous sign by itself. It is the dreaded "Yellow Jack" flag, and is only flown by ships infected with cholera, yellow fever or plague. It means "I have (or had) some dangerous disease on board." The ordinary yellow flag "Q" is by no means to be confused with the foregoing ill omens piece of bunting. It simply means that the vessel flying it is liable to quarantine. Another special flag is "P," the "Blue Peter," which is hoisted when a vessel is about to sail.

A sailor is usually amused at the landsman's ignorance in the matter of flags, but the subject, as has been shown, is a large and very complicated one governed by a large amount of tradition and custom. Flags being far more important on sea than they are on land the penalties laid down in the Merchant Shipping Act to punish their misuse are very severe. For instance, a master is liable to be fined twenty pounds for allowing a pilot signal to be shown on his vessel for any other purpose than to call a pilot, whilst for showing any colours other than his own he may be fined five hundred pounds!



Hauling down an Admiral's flag is a ceremony full of meaning in the Navy. It signifies that he is leaving the ship, perhaps that he is retiring altogether from active service.



The First Voyage of Columbus

THIS inspiration which led to the great voyage that awoke Europe to the fact that there was another world to be reached by sailing westward came from a woman.

 Christopher Columbus, son of a Genoese weaver, had an adventurous youth upon the sea ; he had been north a hundred leagues beyond Iceland and he had been south along the shore of Africa, and he served under a famous sea-captain of his own name, "The Pirate Columbus." During a battle under the "Pirate," Christopher's ship was sunk, and he himself took refuge at Lisbon - he was then twenty-four.

There he met the beautiful Philippa, daughter of Bartholomew Perestrello, one of the chief sea-captains of that great explorer, "Prince Henry the Navigator," and after a short courtship married her. Philippa had the love of the sea in her blood, and her dearest property was the collection of log books, journals, and maps that her father had made. Lovingly she showed these to her handsome, fair-haired sailor-husband, pointing out that if her father's surmises were correct there

was a quicker way of reaching India than had been imagined.

There was then no known way of reaching the alluringly rich land of Hind by sea from Europe. Goods were brought up the Red Sea and transferred across the narrow isthmus of Suez, there to be loaded on to vessels in the Mediterranean. Prince Henry of Portugal had spent the greater part of his life in sending expeditions down the western coast of Africa, hoping that they would reach, eventually, its southernmost extremity, and then turn again north by east for the golden shore of India. He did not live to see the accomplishment of his desire, but in 1486 Bartholomew rounded the Cape of Good Hope.

Meanwhile Columbus had become more and more fixed in his determination to attempt the westward passage to the Indies. Year after year he worked, gathering facts and trying to persuade the King of Portugal of the correctness of his ideas. His only reward was a treacherous attempt to make use of his plans without his aid.

The death of his wife had already saddened him, and this underhand dealing

disgusted him with Portugal altogether. He went to Spain and found there a more sympathetic audience. As must be before the starting of a great enterprise, there was much indecision, and it was not until the 17th of April, 1492, that the article of agreement was finally signed by Ferdinand and Isabella of Spain. The seaport of Palos lay at this time at the mercy of the Crown for defaults in dues and services; and many of its inhabitants were either convicted of crime or were held liable to exemplary punishment. The penalty was now laid upon them of finding ships and men for the new voyage. The royal order was peremptory; nevertheless, it was all but impossible to engage seamen to sail upon this wicked and desperate adventure, as they thought it: to sail, as Columbus hoped, to the great city of Cambalu and its golden mountains, to the land watered by rivers that flowed from Paradise. At length, and after much resistance, Columbus and his friends - two rich shipbuilders called Martin and Vincente Pinzon procured and equipped three little ships. These were the *Santa Maria*, a decked caravel, with a crew of fifty men, commanded by Columbus; the *Pinta*, the swiftest of the three, with thirty men, under Martin Pinzon; and the *Nina*, with twenty-four men, under his brother Vincente. The *Nina*, though small, was a roomy vessel, and afterwards became the admiral's favourite. The whole expense of fitting out the expedition was about £4,000. The ships were victualled for twelve months.

**To ho! for
the
Setting Sun** It was on Friday,
the 3rd of August, 1492, that these three
small ships set sail

from Palos. A vast crowd gathered to see them off. Before going on board, Columbus and his companions repaired in solemn procession to the chapel of the monastery at Rabida to implore the Divine protection, and to receive the Holy Sacrament from the hands of Juan Perez. The desire to spread the Christian

faith held at least as large a share in Columbus's heart as the ambition of discovery.

The fleet weighed and set sail for the Canaries. The day after leaving, the rudder of the *Pinta* broke loose, and, after being repaired as well as they were able at sea, the fastenings gave way a second time. It was more than suspected that some of the crew had done this damage, in

**Underhand
Dealing
by the Crew**

order to force the ship to be put back. The Canaries were reached on August 12th, and after making a new rudder for the *Pinta* and cutting down the sails of the *Nina* to a proper shape, the admiral sailed again on the 6th of September, steering due west. On the 9th they lost sight of Ferio, "the furthest Christian land." "Now," says Ferdinand, "losing sight of land, and stretching out into utterly unknown seas, many of the people expressed their anxiety and fear that it might be long before they should see land again; but the admiral used every endeavour to comfort them, with the assurance of soon finding the land he was in search of, and raised their hopes of acquiring wealth and honour by the discovery. He purposely understated the distance made each day, in order to make his people believe that they were not so far from Spain, after all; but he carefully recorded the true reckoning in private."

For a few days they had to make head against a contrary current; but on the night of the 13th strange signs began to be seen. They had reached a point about a hundred leagues west of the Azores. The compass needle suddenly behaved in a most erratic manner, and puzzled the admiral as well as the seamen.

At this point (says Mr. Charles L. Elton in his "Career of Columbus") they were within the drift of the great "Fuens bank"; it seemed as if they had returned to the weedy shores of Spain, for all the sea was covered with the orange Sargasso plant, shaped like pine-branches, and covered with berries like those on the

mastic tree. "It was so thick," said the admiral, "that I thought it was a reef, and that the ships must run aground, whereas until I reached this line I saw not a single branch." There were also bright green leaves floating a few feet down, which looked like rock-weeds from some neighbouring island; but Columbus

**The First Signs
of a
New Land** said that by his calculation the mainland must be a long way off. "I also observed,"

he added, "that at this point the sea was very smooth, and that, though the wind was rough, the ships did not roll at all." They were borne along on an oceanic current "as calm as the river at Seville"; but the sailors were alarmed at seeing nothing but the sky and the water, and looked anxiously about for tokens of land. On the evening of the 15th they saw a meteor fall "like a marvellous branch of fire," and within a few hours they came into a region of balmy air and blue skies, "like Andalusia in April, if only the nightingales were singing."

"There are signs coming out of the west," Columbus writes in his journal, "where, as I hope, He in whose hands is victory will bring us soon to land." A swimming-crab was caught in a bunch of weed, and the crew of the *Nina* speared a spotted tunny out of a shoal playing round the ship. Some of the others caught a tern, of the kind that haunts the mouths of rivers. A white tropic bird was seen wheeling aloft, and a day or two afterwards there were "boobies," looking like pelicans, flying straight out over the water, as if they were going out to fish or were making for home. When there were two or three of them together, it was a sure sign that they were in their proper ground, and not blown out to sea by accident; and the sailors who had been in Africa said that none of these large birds slept on the water, or were found more than one hundred miles from land. On the 20th they caught a tern, and two or three song-birds came to the ship about dawn, and

flew away at sunrise. It seemed as if they must have islands to the north and south of their course; but the admiral was firm in pushing on towards the Indies. "The weather is fine, and, if it please God, we shall see it all on our way home."

On the 21st they sailed again into a floating weed-bank. A vast sea-meadow seemed to stretch away as far as the horizon. Next day a flock of petrels flitted about the stern of the admiral's ship, bringing bad weather, as sailors say. The wind shifted and blew against their course, and this, says Columbus, was absolutely necessary for me, "because the crews had been in a great excitement at the idea that there were no winds here that could take a ship back to Spain." But the sailors still grumbled at the breeze; it was only a "cat's-paw, or a little flicker of wind, and, if it was too weak to raise the sea, it would never be strong enough to carry them home." The water was moving in a slow stream, with weed hanging round; there were little cray-fishes creeping about its bunches and strings, and a booby and some white sea-birds fishing, and some of the men saw a reed-sparrow and a turtle-dove. Suddenly the sea rose, though there was no longer a breath of wind, and rolled so high that they were all amazed. "This great sea," the admiral repeated, "was quite necessary for me; but such a thing has never happened before, except when Pharaoh went forth after Moses, who delivered the Hebrews from bondage."

Next day Columbus signalled to Pinzon

to bring the *Pinta* alongside and return a map which he had borrowed three days

**"Good
Cheer!
Land ho!"**

before. Pinzon put the map in a case and heaved it to the *Santa Maria*. Columbus and his pilot, Juan de la Cosa, and some of the sailors near them, began to stoop over the map and trace out their probable position. Pinzon meanwhile was watching the sunset from the poop of the *Pinta*, when all of a sudden

he leaped in the air and shouted, "Good news, good cheer, Lord Admiral! Land ho! and good luck to the news!" He pointed to a smear on the sky-line which

By this time the sailors were ripe for mutiny. They muttered at their leader he wanted to be a lord at their expense, while he was but a foreigner, hated at



Columbus owed the inspiration which led to his great discoveries to his wife. She was the daughter of a great sea-captain, and had kept his charts. These she loved to show to Christopher.

loomed like land ahead. Columbus fell on his knees in prayer. Pinzon led off a *Gloria in excelsis* which was taken up by both the crews, and they could see the men of the *Nina* climbing her masts and crowding out in the rigging. But next morning the land resolved itself into sea clouds.

court and scoffed at by men of learning. Some said that the best plan would be to throw him overboard, and say that he had lost his footing when taking an altitude. "It pleased Heaven," says the biographer, "to send fresh signs," and by help of these the admiral managed to

quiet them for a while. About sunrise on Sunday, October 7th, some signs of land appeared to the westward. "but, being imperfect, no person would mention the circumstance. This was owing to

should lose the reward if it were not made out in three days, even if he should afterwards actually prove the first discoverer." Those on the *Nina*, however, forgot this provision and, fancying they saw land, fired a gun and hoisted their colours. This time also they were disappointed.

The crews were now indeed very near to mutiny. But most fortunately on October 11th they met with signs of land which could not be mistaken. From the *Santa Maria* green rushes were seen to float past; and the men on the *Nina* saw a dog rose brier covered with berries. And now they were all racing to earn the reward for the one who should first see land. On the evening of that day, after the *Salve, Regina* had been sung, Columbus made a speech to the men, in which "he reminded them of the mercy of God in having brought them so long a voyage with such favourable weather, and in comforting them with so many tokens of a successful issue to their enterprise";



The sailors were ripe for mutiny. They muttered at their leader, and hinted that he wanted to be a lord at their expense.

fear of losing the reward of thirty crowns yearly for life which had been promised by their Catholic Majesties to whoever should first discover land; and to prevent them calling out 'Land! land!' at every turn without just cause, it was made a condition that whoever said he saw land

and promised that he would add a velvet coat as a special prize of his own for the man who first saw land.

About 10 o'clock that night as Columbus was looking out from his poop cabin, he thought he saw a light moving up and down at a great distance and vanishing

sometimes, as if it were a torch belonging to some fisherman. He called two men to look, and one came in time to observe it, but the other was too late. The light had disappeared. About 2 o'clock in the morning a gun was fired on board the *Pinta*, which was the fastest sailer and always far ahead. Land had been seen about two leagues off by a sailor called Roderigo de Triana. "Being now so near land, all the ships lay to; and to everyone it seemed a long time before morning came." After a voyage of seventy days the New World was found, and the reward was afterwards adjudged to Columbus, "who had been the first to see light in the midst of darkness."

When at length the dawn broke they saw before them a large level island, full of green trees and delicious waters, and to all appearance thickly inhabited. They had, in fact, reached the archipelago of the Bahamas. The crew of the *Pinta* raised their voices and chanted the *Tedeum*. Then, as the sun rose well above the horizon, all the boats were manned. The admiral's went first; he carried the Royal Standard. The other captains each took a banner of the Green Cross, bearing the initials of Ferdinand and Isabella, with a crown over each letter. And so they rowed—with colours flying and music sounding—towards a white line of sandy beach where already crowds of natives were gathered in wonder. The Spaniards were well armed, but it was evident that the natives meant to offer no hostility.

The admiral was the first to step ashore—the first European who set foot on the

**The First Step
on the
New World** New World. He wore his richest dress and carried a drawn sword.

He stepped out of the boat, and knelt and kissed the sand, and gave thanks with tears. The Royal Standard was unfurled, the Cross set up, and the banners raised; the name of San Salvador was given to the island (its Indian name was Guanahani), and Columbus formally assumed the titles of Viceroy and Governor.

When they looked round (we are again quoting Mr. Elton), they must have felt bewildered, like men in a dream. The forest stood like a wall round the blue curve of the bay, with its masses of metallic green, or the soft and liquid colour of the acanthus, silvery or golden or gleaming with blue and topaz; "ever-changing," to use Kingsley's words, **Like Men
in a
Dream** "and iridescent like a peacock's neck." There

were strange naked people grovelling and crawling, or pointing to the armed and bearded Spaniards and their three ships, and then to the sky and the sun. After a time a crowd of them came round and tried to talk with the interpreters. They were the warriors of the Isle of Guanahani, having only one woman with them. Some had their faces smeared with a blood-red stain, others were striped and chequered or plastered with a chalky white; one had his nose painted, another had bright rings round his eyes, and they all looked "like madmen or clowns." Their skins, where the natural colour could be seen, were neither white nor black, but somewhat of an olive colour, like the complexion of the natives in Gomera or the faces of sun-burned labourers in Spain. They were tall and well-shaped, and with good features, except that their foreheads had been squeezed too high, "which made them look rather wild." Most of them had grey eyes, with specks of blue or brown about the iris. Their hands were small, with polished nails, and when they began to laugh and talk their teeth were as white as ivory. Their thick black hair was cropped and worn in a straight fringe above the eyebrows; "some few let it grow down about their shoulders, and held it back with a string, as women tie back their tresses." They carried bundles of darts made out of the stems of reeds or canes, and tipped with spikes of hard wood or sharks' teeth and thornbacks' pines. Before the Spaniards returned to their boats, the admiral distributed a few red caps and strings of beads among

The Sea and its Story

them. A crowd now followed them to the water's edge and swam out to the ships, carrying all their treasures to exchange for memorials of the white men who had sailed from a land beyond the sun. They had parrots and reed-darts and large balls of cotton ; and they possessed a greater treasure than all the

**The Wonders
of a
New Land** rest in the dried tobacco leaves, which the Spaniards did not know how to use.

"The Indians," they said, "value these dry leaves as being sweet-scented and wholesome, and use them as a sort of incense for perfuming themselves."

After exploring the island, Columbus set sail again, taking with him some native guides. On his way he discovered several minor islands. Everywhere he inquired for gold, and everywhere he was told that it came from the south. He began to hear of an island in that direction named Cuba, which, from the mistaken notions of geography then current, he supposed to be identical with Marco Polo's famed gold island of Chipango. There were pearls, too, in great plenty, said the Indians, and this made Columbus sure he was right. At length, they came in sight of Cuba before a fine breeze, and its pink cliffs and blue mountains reminded him of Sicily. The foliage and the face of the earth still seemed like the gardens of Granada. This island, he says, is the fairest ever seen by the eyes of man. They were anchored at the mouth of a broad river. "I never saw anything so magnificent," he repeats. There were palms unlike any that he had seen in Spain or Africa, and giant trees covered with strange fruits and flowers, and there were chirping sparrows and birds singing so sweetly that he often longed to hear them again. He did not indeed find the gold and precious stones he was in search of ; but he made the not unimportant discovery of the Havana cigar. All the natives carried about fire and smoked tobacco, wrapping the leaves together into little rolls "like the toys which the

children play with at Easter." They lit one end and sucked the smoke in by the other, "making themselves drunk through their nostrils," and they said that it took away all sense of fatigue. Being asked whether they had any gold or pearls or spice, they made signs that there was great plenty towards the east, in countries they called "Bohio" and "Babeque," where (according to their pantomime) one might see a crowd there going by torch-light to pick up nuggets on the shore, or standing at great fires to hammer out the yellow lumps and beat them up into bars and ingots.

So the admiral set sail for Bohio, which is Hayti (San Domingo); and on his way caught sight of Babeque, which is Jamaica. He had but two ships now; for Martin Pinzon had carried off the *Pinta* without leave, and was exploring on his own account. As he neared Bohio his Indian guides implored him not to land, as the inhabitants were one-eyed cannibals, fierce and cruel. He, however, sailed closer and closer, and finally cast anchor in a large deep haven. A bird like the nightingale was singing, and many other song-birds, with notes that recalled the April evenings in Spain. The fields reminded them at once of the fertile Vale of Cordova, and for these reasons they were moved to give the island the home-like name of Hispaniola (Little Spain).

The natives were so far from being one-eyed cannibals that Columbus thought them the handsomest Indians he had yet met. And he gives them the highest of characters. "So loving, tractable, and free from covetous-

Columbus's Tribute to the Natives

nesses they are, that I swear to your Highnesses there are no better people, nor any better country, in the world. They love their neighbours as themselves, and their conversation is the sweetest in the universe, being pleasant and always smiling. True it is they go unclothed ; but your Highnesses may believe me that they have many commendable customs."

Here a great misfortune befell Columbus. Having put to sea on the morning of December 24th, at eleven in the evening the admiral retired to his cabin. The sea at the time, to use his own expression, was "as still as water in a dish." No sooner had he left than the steersman gave the helm to a lubber, who let the current carry the vessel upon a treacherous sandbank. At the first shock Columbus and his crew were on deck; but, in spite of aid from the *Nina*, the *Santa Maria* speedily became a wreck. The cacique, or chief man, of the neighbouring village sent out all his people in canoes to assist in unloading her. From time to time, says the admiral, "he sent some of his kindred, weeping, to beg of me not to be cast down, for he would give me all he had. I do assure your Highnesses that better order could not have been taken in any part of Castile to secure our things, for we lost not the value of a pin."

Finding so much kindness among these people, and his son ingenuously remarks, "such strong indications of gold" among the presents made him by the cacique, Columbus almost forgot his grief at the loss of his vessel.

A fort or blockhouse was at once built and, leaving a garrison there of forty-two men, to maintain possession



Columbus was the first European to set foot in the New World. He wore his richest dress, and carried a drawn sword. He stepped out of the boat and knelt and kissed the sand, and gave thanks.

and find out the position of the gold mines, the admiral, on the 4th of January, 1493, started on his voyage home.

The next day they coasted under the slopes of Monte Christi; and now Pinzon

The Sea and its Story

came in at last with some poor excuses, which almost tempted the admiral into a dangerous quarrel. The men of the *Pinta* had found gold, and had heard of rich ground in Jamaiea; but, after all, they had discovered nothing richer than the country about La Navidad, where Columbus had built his fort, and where with his own eyes he had seen quantities of free gold in the river sand. The *Pinta* herself wanted a mast, and had come back riddled with boring worms, and quite unsafe for sea. On the 16th, having learnt from Indians of much gold in the Carib Islands, Columbus actually turned the *Nina's* head in that direction. He had gone but a short distance when a fresh breeze sprang up and blew right for Spain. So sad were all the faces around him and so crazy were the ships that he dared not reject the sign; and so they put about and changed the course, and sailed nearly fifty miles towards home before the sun went down.

Cape St. Elmo was the last land seen. For many days, although the skies were lowering, "the sea ran soft and smooth, like a river." By February 9th the pilots believed they were south of the Azores; but the admiral said "No; they were a hundred and fifty leagues short," and the admiral was right. The wind now began to rise, and the sea to run so high that by Thursday, the 14th, they were driving which way soever the gale would carry them. The *Pinta* had disappeared. The admiral's crew were in despair. They cast lots which

**The Crew
in
Despair** gratitudo to Our Lady
of Guadeloupe, and the
lot fell upon Colum-
bus. Again they all

vowed together that they would go in their shirts, as soon as they came to land, to one of Our Lady's churches. The *Nina* could hardly keep upright for want of ballast, all her provision casks being empty. The admiral, however, staved off the danger, and steadied the ship by filling all his empty casks with sea-water.

What chiefly distressed him was the thought that if the *Nina* foundered, the whole of this most successful expedition, with its tremendously important discoveries, would come to nothing. "Being in this inward confusion," he wrote, "I thought about your Highnesses' good fortune; though I were dead and the ship lost, yet your fortune might find for you some way of saving a conquest so

Sailing Through Grave Dangers

nearly achieved, and bring the success of my voyage by some means or other to your knowledge. For this reason, as briefly as the time would permit, I wrote on a parchment that I had discovered those countries as I had promised, and in what way I had done it and in how many days, and about the goodness of those lands and the nature of the inhabitants, and how your Highnesses' subjects were left in possession of all that I had discovered. I folded and sealed the writing and addressed it to your Highnesses, with a written promise upon it of a thousand ducats to anyone that should deliver it sealed to you."

Having made a copy of the memorandum, he packed one of the documents carefully in oil-cloth and wax, and sent it adrift in a cask. The other was packed in the same way and set upon the top of the poop, so that when the ship sank the cask might have a chance of floating. "Sailing on in such mighty danger and through so great a storm, on Friday, the 15th, at break of day, one Ruy Garcia saw land from the round top." Columbus judged it to be one of the Azores, and at length they succeeded in beating up against the wind, and came to anchor off the island of Santa Maria.

The town lay some distance off; but they saw a little hermitage upon the shore. The boatmen who came off with provisions said that this hermitage was dedicated to the Virgin; and Columbus at once determined that his men should go bare-footed in their shirts and hear a Mass, according to their vow. He had

landed half the ship's crew for this purpose, when the Portuguese Governor of Santa Maria came down upon them with horse and foot and took them prisoners. Columbus at first protested mildly, and then threatened that he would not leave until he had sacked the island and carried off a hundred of its chief inhabitants as hostages. Upon this the men were given back to him.

After leaving this island, they encountered, on March 3rd, a tempest which split all their sails. More vows were made, and the lot again fell to Columbus, "showing," says his son, "that his offerings were more acceptable than others." At length they made shift to set the main-sail, and the vessel once more obeyed her helm; and at daybreak they found themselves off Cintra, at the mouth of the Tagus, and were forced to run into the port of Lisbon; "and this, to my mind," says the admiral, "is the greatest marvel in the world."

It was a bitter blow to the Portuguese to find that Spain had gained the great prize. King John sent for Columbus and listened to his story with a cheerful face, concealing his mortification. As soon as his visitor was gone, he called a



The men of the *Nina* went to a Mass in shirts and barefooted, according to their vow, but the Portuguese descended upon them and made them prisoners.

council, at which it was openly debated whether Columbus should be killed in order to check the Spaniards. "When the good of the State is concerned, everyone knows that morality must give place to wisdom." But King John was not quite equal to the enormity of receiving a guest one day with favour and killing him the next without any fresh offence. So he contented himself with issuing orders for an expedition to go out and take by force the lands which Columbus

had discovered. This expedition, by the way, never sailed. The Pope interfered.

On Wednesday, March 13th, Columbus dropped down the Tagus "on a mighty tide," and set sail with a fair wind for the south of Spain. And about noon on Friday, the 15th, he crossed the bar and dropped anchor at last in the harbour of Palos, seven months and eleven days from the time of his starting on his voyage. The joy and confusion excited by his arrival may be easily imagined. The people crowded down to the shore, and escorted him in triumph to the principal church, where solemn thanksgivings were offered, and soon every bell in the village was set ringing.

Most curious of all, just as the *Nina* was casting anchor in the port, the *Pinta* was spied at the harbour's mouth, creeping past the bar. Nothing had been heard of her since the storm off the Azores, and it was feared that she had perished with all her crew. Pinzon himself could not face Columbus. His is a tragic story. He thought that Columbus would never reach land, and was looking forward to a glorious reception ; he seems always in his own mind to have claimed the chief merit of the enterprise. He meant, says Don Ferdinand, to go by himself to Barcelona, to carry the news to Ferdinand and Isabella ; but they sent him orders not to come except with the admiral under whom he had been sent to serve. On receiving this message, he went straight off to his native place, where he shut himself up in his house and within a few days died of grief.

Columbus went to Barcelona, after performing the vows he had made during the storm. His pilgrimage had been interrupted by the Portuguese at the Azores ; it was now carried out at the monastery of La Rabida, where he had received the Sacrament before starting for his

voyage. Next followed pilgrimages to Our Lady Guadeloupe and Santa Clara at Moguer, by Palos. His journey to Barcelona was one continuous triumph. He was accompanied by several of the native islanders, arrayed in their simple barbaric costume, and decorated with rude collars, bracelets, and ornaments of gold. He exhibited in the principal towns quantities of gold-dust, many quadrupeds, and gaily coloured birds, then unknown in Europe, with numerous specimens of natural productions in the vegetable and mineral kingdoms. It was the middle of April when Columbus reached the Court of Barcelona. The nobility, courtiers, and city authorities came to the gates to meet him, and escorted him to the royal presence.

First of his company marched Juan, the pilot, beneath the Standard of Castile, and next him the painted Indians decked out with feather-cloaks and plumes ; the sailors carried palms and fruits, and birds of gay plumage, strange fishes, conches and turtle shells, and hideous lizards on poles. The admiral rode last.

Ferdinand and the Queen were on their thrones under a canopy of cloth of gold, "and when he went to kiss their hands, they stood up as to some great lord, and made a difficulty to give him their hands," and bade him be seated at their side. And Columbus told them his wonderful tale, concluding in these words : "That God had reserved for the Spanish monarchs not only all the treasures of the New World, but a still greater treasure, of inestimable value, in the infinite number of souls destined to be brought over into the bosom of the Christian Church." As he ended, the whole assembly fell upon their knees, while the choir of the Royal Chapel chanted an anthem of thanksgiving.



The Mutiny of the “Bounty”

HAPPILY the annals of our navy are singularly free from tales of mutiny and rebellion. But mutinies there have been, as is only to be expected in a long record of Admiralty ; and of the few that have reached any degree of importance that of the *Bounty* stands out, both because of the singular circumstances in which it took place, and because of its romantic end.

In the year 1787, being seventeen years after Captain Cook's memorable first voyage, a number of merchants and planters in London memorialised King George III. that the introduction of the bread-fruit tree into the West Indies from the Southern Pacific Islands would be of great benefit to the inhabitants. The king complied with their request. A small vessel, the *Bounty*, was purchased and fitted out under the eye of Sir Joseph Banks, President of the Royal Society, who had been with Cook in his voyage among these very islands, and, indeed (so report said), had actually got himself tattooed in his zeal for acquiring knowledge. The ship was put under the command of Lieutenant Bligh,

The Idea of the Expedition

who had also sailed with Cook ; and her officers and crew numbered forty-four souls,

to whom were added a practical botanist and assistant.

The *Bounty* sailed from Spithead on December 23rd, 1787. On the 26th she was caught by a severe gale from the eastward, which blew for three days, and obliged her to put in at Teneriffe and refit. On January 10th they set

sail again, made the coast of Tierra del Fuego on March 23rd, and encountered tremendous weather off Cape Horn. This weather lasted for nine days, with incessant hail and sleet ; the ship required pumping every hour ; the decks leaked so much that the great cabin was allotted to those who had wet berths to hang their hammocks in.

At last, after thirty days' struggling to make headway, it was

A
Bad
Beginning

determined to bear away for the Cape of Good Hope. The helm was accordingly put a-weather, to the great joy of everybody on board.

They reached the Cape late in May ; remained there thirty-eight days to replenish their stock of provisions and water ; sailed on July 1st, and on October 26th cast anchor in Matavai Bay, Otaheite (or, as it is now spelt, Tahiti), after running a distance of 26,000 and odd miles since leaving England. The natives immediately came out to the ship in great numbers. Tinah, the chief of Matavai, on hearing of the Englishman's arrival, sent a small pig and a young plantain-tree in token of friendship, and the ship was liberally supplied with provisions. Handsome presents were made to Tinah, and he was told that they had been sent to him on account of the kindness of the people to Captain Cook during his visit. “Will you not, Tinah,” said Bligh, “send something to King George in return ?” “Yes,” answered Tinah, “I will send him anything I have” ; and then enumerated a list of articles, among which he mentioned the bread-fruit. This was just what Bligh wanted. Tinah

was told that the bread-fruit trees would please King George very much, and the chief promised that a large number should be sent on board.

The importance of the bread-fruit to these people cannot be overstated. That old navigator, Dampier, had well described it a hundred years before. "The bread-

fruit, as we call it,

The Important Bread-Fruit" grows on a large tree, as big and as high

as our largest apple trees; it hath a spreading head, full of branches and dark leaves. The fruit grows on the boughs like apples; it is as big as a penny loaf when wheat is at five shillings a bushel; it is of a round shape, and hath a thick, tough, rind; when the fruit is ripe, it is yellow and soft, and the taste is sweet and pleasant. The natives of Guam use it for bread. They gather it when full-grown, while it is green and hard; then they bake it in an oven, which scorcheth the rind and makes it black, but they scrape off the outside black crust and there remains a tender thin crust; and the inside is soft, tender, and white." The fruit lasts in season eight months.

There is not the least doubt that Bligh made his first mistake in staying at the island as long as he did. For some reason or other he remained there over five months, during which the crew had all opportunities of leave ashore. Every man of them had his *tavo*, or native friend. From the moment he set foot on land he found himself in the midst of ease, plenty, and happy idleness—temptations all too many for a common sailor. But also, there is not the least doubt, though he carefully conceals it in his narrative (which has too often been taken as a fair and trustworthy statement), that Bligh was a har, a sneak, and a bully, and that his petty offensiveness had at least as much to do with the events we have to relate as the allurements of beautiful Tahiti. Omens of trouble to come were not wanting. One morning the small cutter

was missing, with three of the crew. They had taken with them eight stands of arms and ammunition. The master was despatched with one of the chiefs in pursuit; but before they had gone far they met the boat with five of the natives, who were bringing her back to the ship. The native chiefs promised Bligh to use every effort to catch the deserters and bring them back also; and in a few days some islanders did manage to seize and bind them, but let them loose again on a promise that they would return to the ship. This promise they did not exactly fulfil, but gave themselves up at length, when they found the search growing hot. A few days after this, the cable by which the ship rode was found to be cut close to the water's edge, so that it held only by a strand. Bligh believed that this had been done by one of his own people, who wished to cast the ship ashore, so that they might remain at Otaheite; it may, however, have chafed accidentally.

It was not until April 4th, 1780, that the *Bounty* sailed away from Otaheite, having taken on board over a thousand of the bread-fruit plants, besides other shrubs and fruits. Bligh was congratulating himself on his ship being in good condition, his plants well packed, and all his men and officers in good health and discipline. On April 27th they were between the islands of Tofoa and Kotu in the Friendly group; and, before leaving deck that evening, the captain had given directions as to the course and watches.

Just before sunrise, while he was still sleeping, one Fletcher Christian officer of the watch, with three of the men, entered his cabin, seized him, tied his hands behind his back, and threatened him with instant death if he dared to speak or make the least noise. Bligh, however, called out as loudly as he could, in hopes of assistance; but the mutineers had already secured the other officers by

The Mutiny Begins



Bligh was hauled out of bed and forced up on deck, suffering considerably from the tightness of the cords about his hands.

placing sentinels at their doors. They had, moreover, obtained the keys of the arm-chest, and Christian was armed with a cutlass, and the others with muskets and bayonets. Bligh was now hauled out of bed, and forced on deck in his shirt, suffering considerably from the tightness of the cords about his hands. The master and master's mate, the gunner and the botanist, were confined below, and the fo'castle hatch was guarded by sentinels. The boatswain was ordered to hoist the launch out, and told to do it smartly, or look out for himself; and Mr. Hayward and Mr. Hallet, two of the midshipmen, and Mr. Samuel, clerk, were ordered into it. "What do you mean by this?" asked Bligh. The only answer he got was, "Hold your tongue, sir, or you are dead this instant!" "I continued," says he, "my endeavours to turn the tide of affairs, when Christian changed the

cutlass which he had in his hand for a bayonet that was brought to him, and, holding me with a strong grip by the cord that tied my hands, he threatened, with many oaths, to kill me immediately, if I would not be quiet: the villains round me had their pieces cocked, and bayonets fixed."

The boatswain and seamen who were to be turned adrift with Bligh were allowed to collect twine, canvas, lines, sails, cordage, and an eight-and-twenty-gallon cask of water; Mr. Samuel secured a hundred and fifty pounds of bread, a small quantity of rum and wine, and a quadrant and compass, but was forbidden to touch the maps, observations, sextant, time-keeper, or any surveys or drawings. He did, however, secure the journals and captain's commission. The mutineers having forced those of the seamen whom they meant to get rid of into the boat, Christian directed a

dram to be served to each of his own crew.

After the unpopular seamen, the officers were called upon deck and forced over the side into the boat, Bligh meanwhile being still kept under guard abaft the mizzen-mast. Isaac Martin, one of his warders, had an inclination to serve him, and fed him with some fruit, his lips being quite parched. This kindness was observed, and Martin was ordered away. The same man, with three others, desired to go with the captain, but this was refused. They begged him to remember that they had no hand in the business. Much altercation went on among the mutinous crew during the whole affair. Some swore, "I'll be hanged if he does not find his way home if he gets anything with him"; and when the carpenter's chest was being carried past, "Bless my eyes! he will have a vessel built in a month." Bligh begged for firearms, too, but was laughed at; in the end, however, four cutlasses were tossed into the boat.

The officers and men being now embarked, Christian said, "Come, Captain Bligh, your officers and men are in the boat, and you must go with them. If you attempt to make the least resistance, you will instantly be put to death." Bligh (according to his own account) asked if this treatment was a proper return for the many instances Christian had received of his friendship? At this question Christian (still according to the same account) was much disturbed, and answered with emotion, "That—Captain

Captain Bligh Protests Bligh — that is the thing; I am in hell — I am in hell!"

Of this we may be-

lieve as much as we like. It was shown afterwards that Christian had, only the night before, determined to make his escape on a kind of small raft; that he had informed four of his companions, that they had supplied him with part of a roast pig, some nails, beads, and other trading articles, and

that he abandoned the idea because, when he came on deck to his watch at 4 a.m., he found an opportunity which he had not expected. He saw Mr. Hayward, the mate of his watch, fall asleep, and the other midshipmen did not put in an appearance at all. He suddenly conceived the idea of the plot, which he disclosed to seven of the men, three of whom had "tasted the cat" and were

How the Plot Worked

unfavourable to Bligh. They went to the armourer, and secured the keys of his chest, under the pretence of wanting a musket to fire at a shark, then alongside. Christian then proceeded to secure Lieutenant Bligh, the master, gunner, and botanist. He stated that he had been much annoyed at the frequent abusive and insulting language of his commanding officer. Waking out of a short half-hour's disturbed sleep, to take the command of the deck—finding the mates of the watch asleep—the opportunity tempting, and the ship completely in his power, with a momentary impulse he darted down the fore-hatchway, got possession of the arm-chest, and made the hazardous experiment of arming such of the men as he deemed he could trust. It is said that he intended to send away his captain in a small, wretched boat, worm-eaten and decayed, but the remonstrances of a few of the better-hearted induced him to substitute the cutter.

At any rate, Bligh was now forced over into the boat, which was veered astern. A few pieces of pork were thrown in; and after undergoing a great deal of ridicule, the boat's crew was at length cast adrift in the open sea, while the ship shook out her sails and steered away to the W.N.W. As she went, Bligh heard shouts of "Hooray for Otaheite!" again and again repeated, until they died away in the distance.

In the boat, well weighed down to the water's edge, were nineteen persons, including the commander, master, acting-surgeon, botanist, gunner, boatswain, car-

penter, and two midshipmen. On the ship were twenty-five persons, mostly able seamen, but three midshipmen were among the number, two of whom had no choice in the matter, being detained there against their wills.

And now let us follow the fortunes of Bligh and his companions. Their first

All they could obtain from the natives, however, were a few coco-nuts, with a small supply of bread-fruit. Moreover, the natives, seeing their defenceless condition, speedily began to crowd the beach, knocking stones together, the preparatory signal for an attack. Seeing this, the Englishmen walked quietly back



The natives would have pulled the boat in to shore again had not Bligh pulled out his knife and cut the rope quickly.

step was to examine their provisions, which they found to be 150 lbs. of bread, sixteen pieces of pork, each piece weighing 2 lbs., six quarts of rum, six bottles of wine, and twenty-eight gallons of water. Being near the island of Tofoa, they resolved to row thither and seek extra supplies of bread-fruit and water. They made the island soon after dark; but the shore proved to be steep and rocky, and without anchorage, and they had to wait until morning to find a landing.

to their boat, not showing their trepidation, but in a silent kind of horror. The surf was running high. With great difficulty they succeeded in getting their things together, and all the men into the boat, except John Norton, one of the quartermasters, who had run up the beach to cast the sternfast off. While he was doing so, the signal was given, the natives rushed upon him in a moment, and the poor fellow was stoned to death before the eyes of his comrades. His

assailants at once got hold of the stern rope, and would have hauled the boat ashore in a trice had not Bligh whipped a knife from his pocket and cut the rope quickly. As it was, they pushed out to sea in hot haste, every man being more or less hurt by the showers of stones. Several canoes were pushed off in pursuit.

A Narrow Escape The only expedient the Englishmen could think of to gain time was to throw over-

board some of their clothing, which the natives, fortunately, stopped to pick up. Night fell while they were thus occupied, and the canoes returned to shore.

They had now no hope of relief, unless they could reach Timor, a distance of full twelve hundred leagues, and this in an open boat only twenty-three feet in length, and deeply laden with eighteen men. The men agreed to be put on an allowance, which on calculation was found not to exceed *one ounce* of bread a day, and a gill of water. It was about eight o'clock at night, on May 2nd, that they bore away under a reefed lug-fore-sail : and, the people being divided into watches, and the boat got into a little order, they returned thanks to God for their miraculous preservation.

Next morning, the sun rose fiery and red, a sure indication of a gale ; and by eight o'clock it blew a violent storm, the waves running so high that their sail was actually becalmed between the seas, though at the top of the seas it could not have been set for the force of the wind. They could not, however, venture to take in the sail, being in very imminent danger, the sea curling over the stern of the boat and obliging them to bale for dear life. They lightened ship by throwing overboard all superfluous clothes, with some spare sails and rope ; and, removing the tools to the bottom of the boat, stowed the bread, on which their existence depended, in the carpenter's chest. As they were all thoroughly wet and cold, Bligh served out a tea-spoonful of rum to each. The

sea still rose, and the fatigue of baling became very great. At daylight on the 4th the men's limbs were benumbed, and another spoonful of spirits was given. Their dinner that day consisted of five small coco-nuts and a few broken pieces of bread-fruit. By the morning of the 5th the gale had abated, and the boat was running among some islands ; but after their reception at Tofoa, they did not venture to land. On examination, a great part of their bread was found damaged and rotten ; but even this was carefully preserved for use. On the 6th they still continued to see islands in the distance ; and this day, for the first time, to their great joy, they hooked a fish, but were miserably disappointed by losing it as they were trying to get it into the boat. They were sadly cramped for want of room, though Bligh did his best by putting them watch and watch, so that half of the men could lie down in the bottom of the boat. On the 7th they passed by close to some rocky islets, from which two large sailing canoes came out and pursued hotly, but gave over the chase in the afternoon. This day heavy rain fell and everybody set to work to catch some, with such success that they not merely quenched their thirst, but increased their stock to thirty-five gallons. As a corresponding disadvantage they got wet through. On the 8th the allowance issued was an ounce and a-half of pork, a teaspoonful of rum, half-a-pint of coco-nut milk, and an ounce of bread. Bligh constructed a pair of scales of two coco-nut shells, using pistol-balls for weights.

The Sufferings of the Loyal Men

The next nine days brought bad weather and much rain, the sea breaking over the boat so much that two men were kept constantly baling, and it was necessary to keep the boat before the waves to prevent her filling. When day broke, it showed a miserable set of beings, full of wants, aches, and pains, and nothing to relieve them. They found some comfort by

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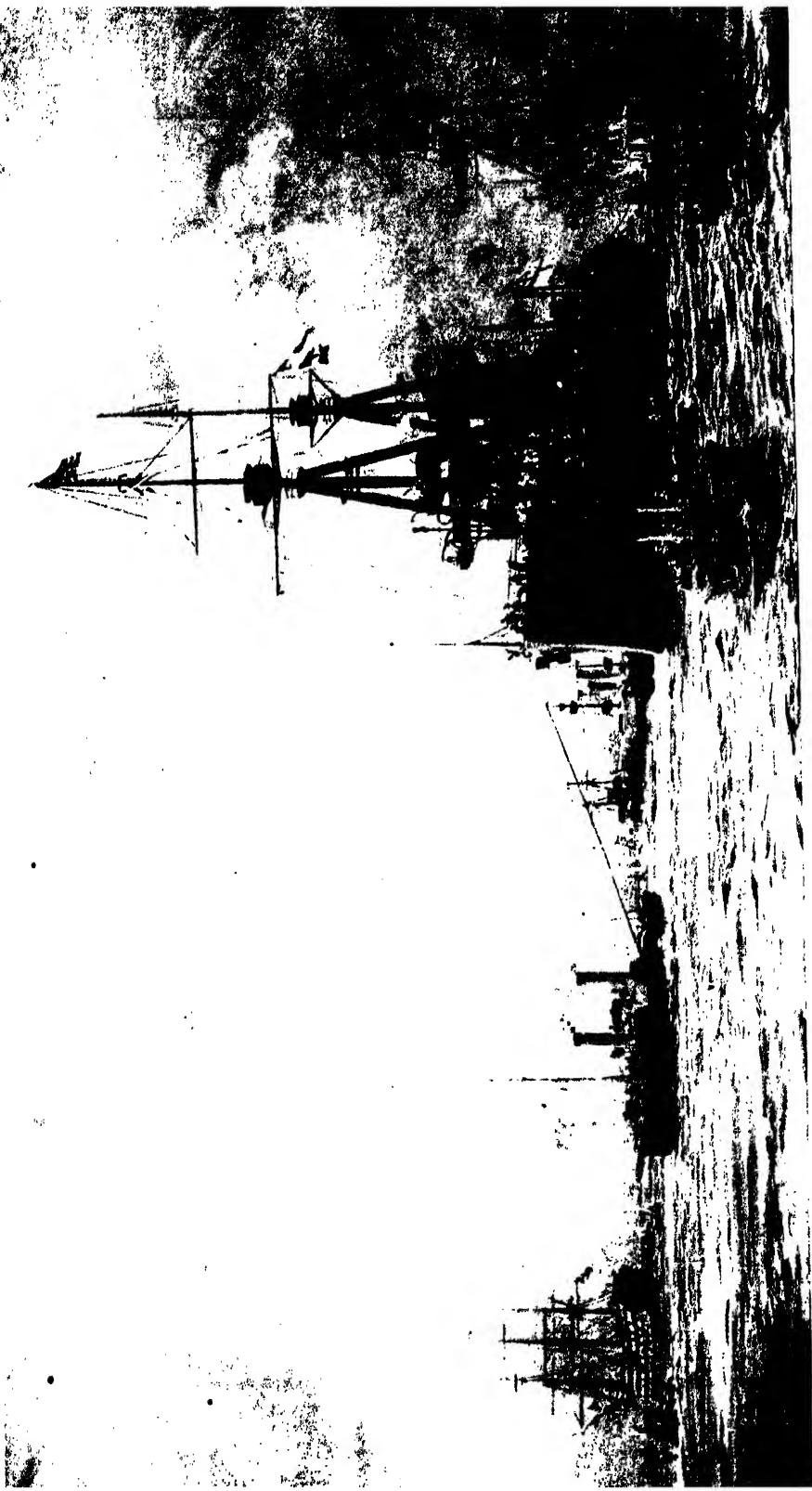
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NAVY MIXTURE

H.M.S. BELLEOPHON.

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THE SEA AND ITS STORY



EDITED BY
**CAPT FRANK H. SHAW
AND ERNEST H. ROBINSON**

**CASSELL AND COMPANY, LIMITED,
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PEATMOOR

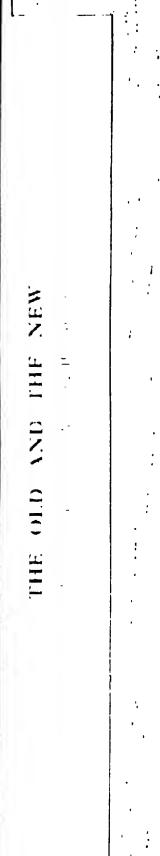
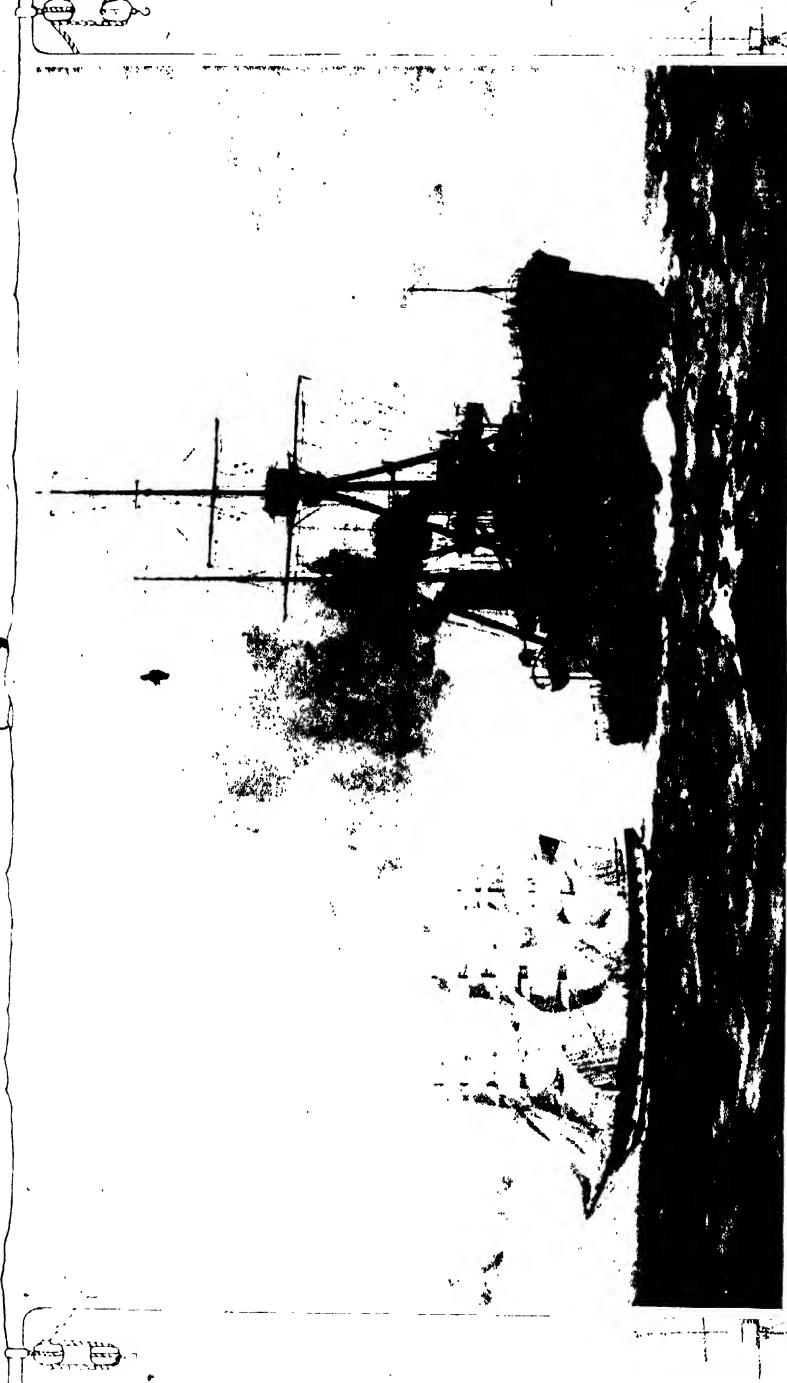
Old Scotch

WHISKEY.

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THE OLD AND THE NEW



wringing their clothes in sea-water, by which means they found a certain limited amount of warmth. But though all were shivering with cold and wet, the commander was obliged to tell them that the rum ration—one teaspoonful—must for the present be discontinued, as it was running low.

**Nights
of
Horror** "During the whole of the afternoon of the 21st," says Bligh,

"we were so covered with rain and salt water that we could scarcely see. We suffered extreme cold, and everyone dreaded the approach of night. Sleep, though we longed for it, afforded no comfort; for my own part, I almost lived without it. . . . The misery we suffered this night exceeded the preceding. The sea flew over us with great force, and kept us baling with horror and anxiety. At dawn of day I found everyone in a most distressed condition, and I began to fear that another such night would put an end to the lives of several, who seemed no longer able to support their sufferings. I served an allowance of *two* teaspoonsfuls of rum; after drinking which, and having wrung our clothes, and taken our breakfast of bread and water, we became a little refreshed." On the 24th, for the first time in fifteen days, they experienced the warmth of the sun, and dried their now threadbare garments.

On the 25th, at midday, some noddies flew so near the boat that one was caught by hand. This bird, about the size of a small pigeon, was divided into eighteen portions, and allotted by the method known as "*Who shall have this?*" in which one person, who turns his back to the caterer, is asked the question, as each piece is indicated. This system gives everyone the chance of securing the best share. That and the following day two boobies, which are about as large as ducks, were also caught. The sun came out so powerfully that several of the people were seized with faintness. But the capture of two more boobies

revived their spirits, and as, from the birds and other signs, Mr. Bligh had no doubt they were near land, the feelings of all became more animated. On the morning of the 28th, the "barrier-reef" of what was then known as the eastern coast of New Holland, now Australia, appeared, with the surf and breakers outside and smooth water within. The difficulty was to find a passage; but at last a fine opening was discovered, and through this the boat passed rapidly with a strong stream, and came immediately into smooth water. Their past hardships seemed all at once forgotten. The coast appeared, and in the evening they landed on the sandy point of an island, where they soon found that the rocks were covered with oysters and that plenty of fresh water was attainable. By help of a small sun-glass a fire was made, and soon a stew of oysters, pork, and bread was concocted, which gladdened their hearts, each receiving a full pint. The 29th of May being the anniversary of the restoration of Charles II., they called the spot Restoration Island, a name not inapplicable to their own ease of recovered health and strength.

Bligh soon noted the alteration for the better in the looks of his men, which proved the value of oysters stewed, as they sometimes were, with fresh green palm-tops. Strange to say, a mutinous spirit, which had been satisfactorily absent before, broke out in a few of the men. "One person in particular," says Bligh, "went so far as to tell me, with a mutinous look, that he was as good a man as myself. It was not

**Mutiny
Dies
Hard**

possible for me to judge where this might have an end if not stopped in time; therefore, to prevent such disputes in future, I determined either to preserve my command or die in the attempt. Seizing a cutlass, I ordered him to take hold of another and defend himself; on which he called out that I was going to kill him, and immediately made concessions. I did

not allow this to interfere further with the harmony of the boat's crew, and everything soon became quiet.

But although the worst of their voyage was over, their troubles in other ways were serious. While among the islands

doubling Cape York, the northernmost portion of Australia (or New Holland, as it was then called), the little boat and her crew once more launched out into the open ocean. On the 5th a booby was caught by the hand, and the blood



The waves came aboard constantly, obliging them to bale for dear life.

of the coast of Australia, several of the men suffered greatly from weakness, dizziness, and violent pains in their bowels. Very small doses of wine were given, to their great benefit. A party was sent out on one of the islands to catch birds, and they returned with a dozen noddies; these and a few clams were all they obtained. On the 3rd of June, after passing several islands and

divided among three of the men who were weakest, the bird being kept for next day's dinner. On the 7th the sea ran high, and kept breaking over the boat. Mr. Ledward, the surgeon, and Lebogue, an old and hardy seaman, appeared to be breaking up fast; but no other assistance could be given them than a teaspoonful or two of wine. On the morning of the 10th there was a

visible alteration for the worse in many of the people. Their faces were hollow and ghastly, their limbs swollen and all extremely weak; some spent all their time in a sort of stupid doze, and seemed to have lost their reason. One hope alone supported them, that in a few hours, at the rate they were then sailing, they would see the land of Timor ahead. From the afternoon of the 7th birds and floating branches of trees gave signs of land being near. On the 11th Bligh was able to announce that they had passed the meridian of the eastern end of Timor. All eyes were fixed on the horizon ahead. Evening fell without them being able to discover anything on the vast expanse of ocean; but, at three o'clock on the following morning, as day broke, a cultivated coast, finely diversified with hill and woodland, appeared in wide extent before them. Timor at last! Forty-one days they had been on the ocean in their miserable boat; by the log they had run 3,618 nautical miles, and, notwithstanding their extreme distress, without the loss of a single life since poor Norton was killed at Tofua.

The crew, who now considered their safety assured, were eager to land at the nearest shore; but Bligh, considering that the Dutch held but a corner of this large island, steered towards the south-west part of it, in which he had a vague recollection of hearing that the Dutch were settled. And, about two o'clock on the 13th, after running through a dangerous sea, they came to a spacious bay with an entrance so convenient for

**Saved
at
Last** shipping that they hoped it might be a European settlement.

Seeing a hut, a dog, and some cattle near a sandy beach, the gunner and boatswain landed, and soon returned with five natives, from whom they had met with a hospitable reception. These men informed Bligh that the governor lived at Coupang, some little distance to the north-east, and one native went with them to show the way;

but, the wind falling light, they came to a grapnel at ten o'clock. Next morning, "after the most happy and sweet sleep that ever man enjoyed," they weighed and continued to move east; and soon the report of two large guns came booming along the water. They were electrified with joy by this, the first sound of European existence; and shortly after two square-rigged vessels and a cutter appeared

**Tears
of
Gratitude**

at anchor. They now took to their oars and rowed till daybreak, when they found themselves opposite the small fort and town of Coupang. Among the odds and ends which had been thrown into the boat, before it was cut adrift from the *Bounty*, was a bundle of signal flags; and with these, in the course of the voyage, Bligh had made a small Jack, which he now hoisted in the shrouds as a signal of distress. The sun was scarcely up before a soldier hailed them from the shore and told them to land, which they did at once amid a crowd of Indians, who stared, as well they might, at this crew of spectres; their bodies, skin and bone and covered with sores; their hair long and unkempt; their clothes in rags; and tears of joy and gratitude running down their starved cheeks. Almost the first person they met on shore was an English sailor, belonging to one of the vessels in the road, commanded by Captain Spikerman, the second person in the town. This captain, as well as the governor, received the party with the greatest hospitality; but the strain had been too much for several of them. The botanist died at Coupang, three of the men at Batavia, and one of them on the passage home, which they made partly in a little schooner purchased by Bligh and partly in the *Vansittart* packet. The doctor was left behind, and not afterwards heard of. Bligh reached England on March 13th, and received much sympathy; he was at once promoted to the rank of commander, and a second time sent out to

transport the bread-fruit to the West Indies, which he successfully did.

Meantime the Government naturally proposed to bring the mutineers to trial, whatever it might cost. To this end, the *Pandora* frigate, of twenty-four guns and one hundred and sixty men, was sent out under the command of Captain Edward Edwards, with orders to proceed to Otaheite, and, if necessary, the other islands in pursuit of the delinquents.

The *Pandora* passed the Straits of Magellan in January, 1791, and came to anchor in Matavai Bay, Otaheite, on the 23rd of March. The *Bounty*'s armourer, Joseph Coleman, put off for the ship almost before her anchor dropped : he was followed immediately by Mr. Heywood and Mr. Stewart, midshipmen, and soon after by four others of the *Bounty*'s crew. These readily gave Captain Edwards information. It appears that Christian and nine men had long since left Otaheite in the *Bounty*; but that the rest of the mutineers, having built a small schooner, had only the day before sailed out of Matavai Bay, meaning to settle somewhere in the north-western part of the island. Hearing this, Captain Edwards sent off the pinnace and launch in chase. The schooner was secured at Papara, but the mutineers had fled to the mountains. In a day or two, however, they ventured down, and when within hearing were ordered to lay down their arms, which they did, and were carried off in irons to the *Pandora*. Here Captain Edwards put them in a round-house, built on the after-part of the quarterdeck, in

The Mutineers' Quarters order to isolate them from his crew. According to the state-

ment of one of the prisoners, the midshipmen were kept ironed by the legs, separate from the men, in a kind of round-house, aptly named "Pandora's Box," which was entered by a scuttle in the roof, about eighteen inches square. "The prisoners' wives visited the ship daily, and brought their children, who were permitted to be

carried to their unhappy fathers. To see the poor captives in irons," says a narrative of this visit, "weeping over their tender offspring, was too moving a scene for any feeling heart. Their wives brought them ample supplies of every delicacy that the country afforded while we lay there, and behaved with the greatest fidelity and affection to them."

A Painful Interview

Stewart, the midshipman, had married the daughter of an old chief, and they had lived together in the greatest harmony. On hearing that Stewart was confined in irons, Peggy (as her husband had named her) put her child—a beautiful little girl—into a canoe, and paddled off in the greatest distress to the ship. The interview was so painful that Stewart begged she might not be allowed on board again. Forbidden to see him, she sank into the deepest dejection, refused all food, and pined away and died two months afterwards.

Of the sixteen mutineers who were left at Otaheite, fourteen were now secured. The other two, Churchill and Thompson, had perished by violent deaths. They had made friends with the chief, and Churchill had become his *tayo*, or sworn friend. The chief died suddenly without issue, and Churchill, according to the custom of the country, succeeded to his property and dignity. Thompson soon afterwards shot Churchill, probably to acquire his possessions, and was in turn stoned to death by the natives, who brought his skull to the *Pandora*.

Captain Edwards learned that after Bligh had been set adrift, Christian had thrown overboard the greater part of the bread-fruit plants, and divided the property of those they had abandoned. They at first went to an island named Toobouai, where they intended to form a settlement, but the opposition of the natives, and their own quarrels, determined them to revisit Otaheite. There the leading natives were very curious to know what had become of Bligh and



The master-at-arms let the keys unlocking the handcuffs and irons fall through the scuttle, and the prisoners were assisted by one brave sailor, who said he would set them free or go to the bottom with them.

the rest, and the mutineers invented a story to the effect that they had unexpectedly fallen in with Captain Cook at an island he had just discovered, and that Lieutenant Bligh was stopping with him, and had appointed Mr. Christian commander of the *Bounty*; and, further, he was now come for additional supplies for them. This story imposed upon the

Off the east coast of New Holland, the *Pandora* ran on a reef and was speedily a wreck. In an hour and a half after she struck there were eight and a half feet of water in her hold, and, in spite of continuous pumping and baling, it became evident that she was a doomed vessel. With all the efforts made to save the crew, thirty-one of the ship's

company and four mutineers were lost with the vessel. Very little notice, indeed, seems to have been taken of the latter by the captain, who was afterwards accused of considerable inhumanity. "Before the final catastrophe," says the surgeon of the vessel, "three of the *Bounty*'s people, Coleman, Norman, and M'Intosh, were now let out of irons, and set to work at the pumps. The others offered their assistance, and begged to be allowed a chance of saving



The interview was so painful that Stewart begged she might not be allowed on the ship again.

simple-minded natives, and in the course of a very few days the *Bounty* received on board thirty-eight goats, 312 hogs, eight dozen fowls, a bull and a cow, and large quantities of fruit. They also took with them a number of natives, male and female, intending to form a settlement at Toobouai, Christian having been heard frequently to say that his object was to find some uninhabited island, in which there was no harbour, that he would run the ship ashore, and make use of her materials to form a settlement. This was all that Captain Edwards could learn, and after a fruitless search of three months he abandoned further inquiry, and proceeded on his homeward voyage.

their lives; instead of which two additional sentinels were placed over them, with orders to shoot any who should attempt to get rid of their fetters. Seeing no prospect of escape, they betook themselves to prayer and prepared to meet their fate, everyone expecting that the ship would soon go to pieces, her rudder and part of the stern-post being already beaten away." When the ship was actually sinking, it is stated that no notice was taken of the prisoners, although Captain Edwards was entreated by young Heywood, the midshipman, to have mercy on them, when he passed over their prison to make his own escape, the ship then lying on her broadside with the larboard bow completely under water.

Fortunately, the master-at-arms, either by accident, or, probably, design, when slipping from the roof of "Pandora's Box" into the sea, let the keys unlocking the handcuffs and irons fall through the scuttle, and thus enabled them to commence their own liberation, in which they were assisted by one brave seaman, William Moulter, who said he would set them free or go to the bottom with them. He wrenched away, with great difficulty, the bars of the prison. Immediately after the ship went down, leaving nothing visible but the top-mast cross-trees.

More than half an hour elapsed before the survivors were all picked up by the boats. Amongst the drowned were Mr. Stewart, the midshipman, and three others of the *Bounty*'s people, the whole of whom perished with the manacles on their hands. Thirty-one of the ship's company were lost. The four boat-loads which escaped had scarcely any provisions on board, the allowance being two wine-glasses of water to each man, and a very small quantity of bread, calculated for sixteen days. Their voyage of 1,000 miles on the open ocean, and the sufferings endured, were similar to those experienced by Bligh's party, but not so severe. After staying at Coupang for about three weeks, they left on a Dutch East Indiaman, which conveyed them to Samarang, and subsequently Batavia, whence they proceeded to Europe.

After an exhaustive court-martial had been held on the ten prisoners brought home by Captain Edwards, three of the seamen were condemned and executed; Mr. Heywood, the midshipman, the boatswain's mate, and the steward were sentenced to death, but afterwards pardoned; four others were tried and acquitted. It will be remembered that four others were drowned at the wreck.

Twenty years had passed away, and the *Bounty*, and Fletcher Christian, and the piratical crew he had carried off with him in that ship, had long ceased to occupy a thought in the public mind, when a Captain Folgar, of the American ship *Topaz*, reported to Sir Sydney Smith at Valparaiso that he had discovered the last of the survivors at Pitcairn Island, the southernmost of the southern islands in the Low Archipelago. The information was transmitted to the Admiralty, and received on May 14th, 1809; but the troubles of those times prevented any immediate investigation.

In the autumn of 1814, H.M.S. *Briton*, commanded by Sir Thomas Staines, with the *Tagus*, Captain Pipon, was cruising in the Pacific, and on September 2nd left the Marquesas, and steered to the southward, intending to make the port of Valparaiso. In the second watch of the night, land was unexpectedly discovered, and disclosed to them a fertile shore, varied with huts and cultivated ground; and on the beach a gathering of people, among whom there appeared an alacrity much greater than usual to hail the Europeans. It was Pitcairn Island, and the people were the descendants of the *Bounty* mutineers. The only surviving man of the crew was John Adams, and he told how Christian had been shot by an Otaheitan, together with two of the others.

When Captain Beechey, in his famous voyage of discovery on the *Blossom*, called at Pitcairn Island in 1825, he found Adams, then in his sixty-fifth year, dressed in a sailor's shirt and trousers, doffing his hat and smoothing down his bald forehead whenever he was addressed by the officers of the *Blossom*. Adams died in 1829, and so the last of the *Bounty* mutineers went to his account.



Policing the Fisheries

THE small cruiser passed like a shadow from the quiet of Lowestoft harbour, where lay the lithe, slim yachts, their lights glittering in the placid water, then starboarding her helm she got round the pier-head and flopped away into the gusty darkness of the North Sea.

She was the policeman of the fisheries, one of those smart little craft whose duty it is to prevent foreign fishing craft encroaching within our waters (which stretch three miles to sea from the coastline) and there plying their trade.

Her crew were typical British blue-jackets, clean-shaved, sturdy of limb and keen of eye, able to handle the breaker of their country's laws with tact and discretion.

The day was very old when I arose from the cushions of the tiny cabin and, well wrapped in thick clothing, including two stout woollen sweaters (for the August night was cold at sea), went up the companion stairs, along the wet deck, and thence by easy stages to the bridge. All around was the black heaving sea, coming now and then over our fo'castle in a rattle of cold, lashing spindrift. The officer of

**Watching
Through the
Night** the watch was peering shoreward at the big beam of light that denoted the presence of a dangerous headland.

"Going to have any luck?" I asked, going up to the dark figure.

"Goodness knows," he answered, placing his night glasses under his arm. "As you have come out with us to see some fun, I should say the chances are twenty to one against our seeing

even one of our own craft, let alone a foreigner."

"That's the usual luck," I mumbled with a wry smile; "but you know things have been very rotten on the Continent lately, and some of the poor beggars have to choose between waiting at home hoping and starving and a dash across the North Sea during the darkness and then a bit of poaching among the soles. After all, our men retaliate when their luck's out."

"Quite right," he nodded, with a weather eye on the dark shadow that marked the eastern shores of England; but there's a difference. When we catch the beggars red-handed with fish in their hold, what happens? Why, they are lugged before the magistrates, and promptly pitch a pathetic yarn, are fined a five-pound note, and allowed to sling their hook as soon as they have dubbed up.

"Then just imagine that one of our boats gets caught at the game over on the other side of the North Sea. Her master is promptly put in prison, where he may remain for a week, perhaps. Then, when they condescend to try the poor beggar, it's nothing less than a twenty-pound fine, with confiscation of his catch and gear as a matter of course, and perhaps, furthermore, they may collar every blessed thing they can lay their hands on. A loss of over two hundred pounds may have to be faced by the owners. That's why poaching within the territorial limit is more popular on this side."

He strode across the bridge to the

To
**Starve or
Poach?**



muffled figure at the wheel, and proceeded to give orders, then came back to me and gave forth strange yarns of the sea in such fine form that the dreary hours sped by and half-past two was showing on the face of my watch ere anything happened. Suddenly from the shadowy black mass that marked the whereabouts of our bow there came a faint cry. Then a sailor just a blur of glistening oilskins

another oilskin coated figure. "Call the captain," he said. "Tell him I am going to board a Frenchman."

Then he turned to a cluster of dark forms that had got round the boat davits.

"Seaboat's crew, man your boat!" A second after the crisp order dark forms were in her, and she was dancing under our lee. We clambered in with the rest and cast off.



H.M.S. *Spanker*, one of the ships of the Navy that is engaged in fishery protection duty.

—reported he had seen the loom of a sail inshore.

Instantly night glasses were glued to our eyes, and there, sure enough, was a smack with her lights out—a black, sinister object against the scudding clouds.

"Stop!" The engines instantly ceased to thud us ahead.

"Out lights!" In the darkness we rolled on the swell waiting and watching in silence, with only the lap of the sea and the scream of a sea bird in the distance to break the calm.

The officer leaned over the bridge to

In the far distance glowed white the beam of Orfordness Light, and far to the north we could still see the sparkle of the Lowestoft High Light. As I sat pondering we were dancing nearer and nearer our quarry. The clicking of her capstan proclaimed the fact that she was hurriedly hauling in her nets, and the rattle of the rings told us more, that she was getting up sail, with the hope of giving us the slip.

These were quiet, tense moments, pregnant with stifled excitement. Not a man spoke: those at the oars pulled with the

same stiff, steady stroke. We were trying to cut her off and prevent her slipping out of the three-mile limit ere we could secure her, for up to now, owing to the darkness, we could not make sure that she was actually fishing.

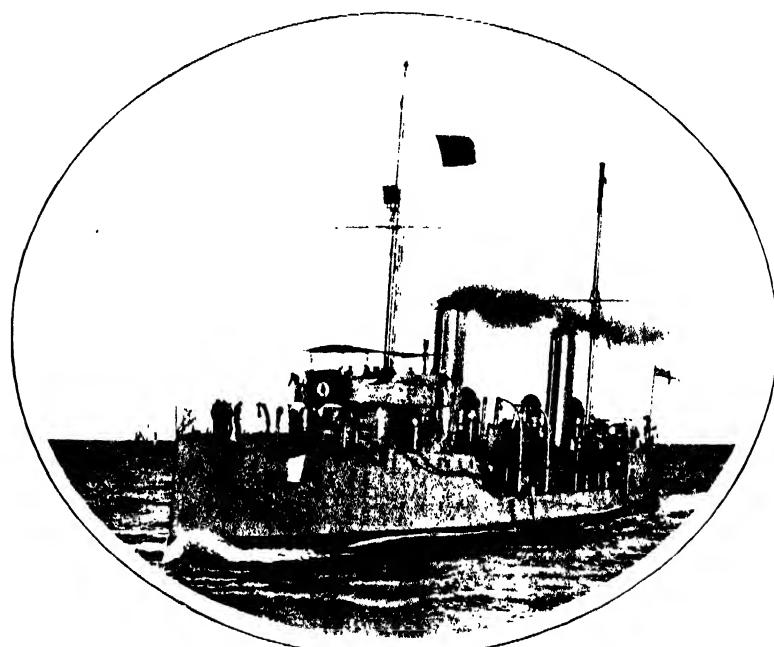
At last we came under her lee and hooked tight. On the instant, nimble men clutched any available object, vaulted her bulwarks, and squelched along her wet decks, whilst but two and a-half miles away Southwold, filled with its summer crowds, slept in peace, little knowing that out at sea in the darkness British bluejackets were boarding a foreigner as our men did in the days of long ago.

A burly form came lurching forward, and on seeing the strangers voiced a loud

French oath and ran aft again. Quick on his heels were the cruiser's men, and they told him plainly that he and his crew were under arrest. The trawl was still down, and fish—poached fish—in the hold, so that it was a case of "caught red-handed."

As the wet haze that came blowing up blotted out the Southwold lantern and obscured Orfordness in the far sou'-west, our puny warship loomed up and cast us a tow rope; and as the "prize crew" aired their French and smoked a cigarette with their sullen prisoners, I returned to the gunboat, and, with the appetite of the proverbial horse, retired for hot coffee and the necessary etceteras as the grey tinge far at sea told of the coming of another day.

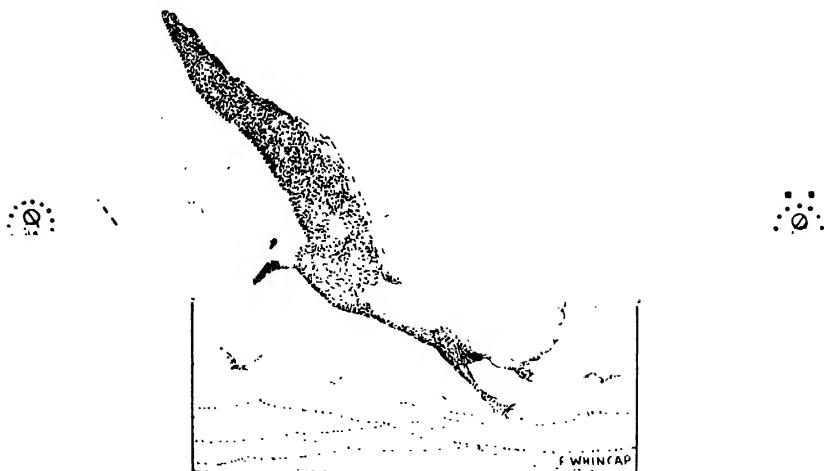
H. DAVIS.



H.M.S. *Halcyon*, flying the International Fisheries Protection flag.

The Sea and the Scientist

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ONE of the most modern of sciences and at the same time one of the most fascinating is Oceanography, which deals with nearly three-quarters of the Earth's surface and all that lies beneath that vast expanse—or, to be more precise, the Oceanographer has for his domain 142 millions of miles of the 107 millions of miles which is the measurement of the Earth's whole surface.

On land there is little left for the explorer. One by one the remote islands and hidden places of the continent have yielded up their secrets, have been explored, mapped, surveyed, their numbers and peculiarities noted and set down in a book; but old Ocean still shows an almost inscrutable face to the prying eyes of man. In his abysmal solitudes, where no sunlight can penetrate, and where the slowly moving currents have a temperature of little above the freezing point of fresh water, what secrets does he hide? Of one thing we are certain. The extreme ocean depths are not, as was until very recently believed, the home of absolute solitude and death. In the compara-

tively few spots where the naturalists' dredge has penetrated deeply into these vast spaces of eternal night, living creatures have been found.

But, still, we know little more of the Under Sea than did the sailors of the time of Solomon. True, he knew no more than he could learn by diving open-eyed into the warm surface waters of his Mediterranean, whilst we have diving-bells and diving-suits that will enable us to stay down at a depth of nearly two hundred feet, but the average depth of the ocean is about two and a-half miles below ordinary sea level, and the only means we have of getting down beyond the mere surface water is by means of the sounding line.

Until three hundred years ago no soundings below two hundred fathoms, or twelve hundred feet, had been made, and the first organised attempt to examine the sea bottom was not made until 1872, when H.M.S. *Challenger* spent the better part of five years sounding in all depths at hundreds of stations, dredging up specimens of deep-dwelling creatures and taking records of the material of the seabed, temperature of the water at all depths, and testing the deeps of the ocean in every way they could.



The Sea and its Story

This and subsequent surveys, though they have actually measured the depth of but a few portions of the ocean, have proved that the bed of the sea is no more a vast flat surface than the land is.

In a highly interesting article contributed to "The International Geography," Sir John Murray, K.C.B., F.R.S. (of the *Challenger* expedition), and Dr. Hugh R. Mill, two of the greatest authorities on Oceanography, put the matter very clearly.

"The general form of the ocean basins," they say, "is a vast depressed plain, yet the floor of each ocean is diversified by ridges and troughs, the deepest parts frequently occurring not in the centre of the ocean but comparatively near shore. The configuration of the ocean floor is of great practical importance for laying telegraph cables. The greatest depth hitherto reported in the ocean is 5,155 fathoms (or 250 yards less than six miles) to the east of the Kermaidoc Islands in the South-West Pacific, and not far off another sounding of 5,147 fathoms was obtained. These are the only records of depths exceeding 5,000 fathoms, though soundings in depths between 4,000 and 5,000 fathoms are comparatively numerous. The greatest depth known in the Atlantic is 4,660 fathoms, to the

north of the West Indies; whilst in the Indian Ocean no depth approaching 4,000 fathoms has yet been found, the deepest sounding being a little over 3,200 fathoms. It is worthy of remark that Sir James Clark Ross ran out 4,000 fathoms of line in the Southern Ocean to the south of South Georgia without reaching bottom."

The North Atlantic, as a consequence of the numerous cables that have been taken across it (there are now fifteen in full working order), is the ocean about whose deeps we know most, but gradually our general knowledge of other seas and oceans is extending. The ships of our navy are continually lowering their scientifically adjusted sounding lines and taking accurate record; whilst there are

many merchant

skippers who, armed with Lord Kelvin's sounding machine—a clever invention that has done much to reveal the secrets of the ocean—do not neglect their chance of probing the unknown.

The general characteristics of the water of the oceans have long been worked out to a great degree of exactness. For the benefit of those who desire precise information it may be said that in 1,000 parts by weight of sea water there are 962 parts of pure water; 27.1 parts of chloride



Photo: Pictorial Agency.
The narrow platform from which ordinary hand-sounding is carried on in the Navy. In the top left-hand corner of the picture will be seen the end of the deep-sea sounding line and the lead.

of sodium ; 5.4 parts of chloride of magnesium ; 0.4 part of potassium chloride ; 0.1 part of bromide of magnesia ; 1.2 part of sulphate of magnesia ; 0.8 of sulphate of lime, and 0.1 of carbonate of lime. The remaining 2.9 parts by weight consist of sulphuretted hydrogen, hydrochlorate of ammonia, iodine, iron, copper and even very minute quantities of silver and gold. In examining the copper plates taken from the bottom of a ship at Valparaiso, which had been a very long time at sea, distinct traces of silver were found deposited by the sea.

Although the composition of sea water is practically the same in all parts of the world, the amount of salts held in solution



A wonderful photograph of an octopus taken under the water. The octopus and similar creatures grow to an immense size in the deeper seas.

varies very considerably. For instance, the water of the Atlantic contains more salt than that of the Black Sea, and the Mediterranean even more than the Atlantic. The Red Sea is saltier still,

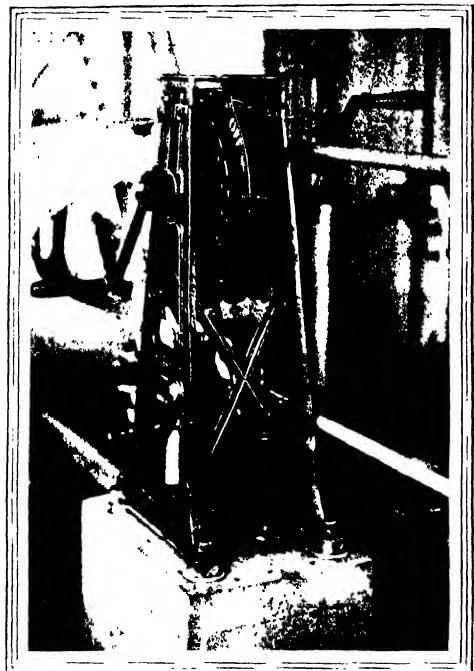
whilst such waters as the Dead Sea, the Great Salt Lake of Utah, or Lake Urumia in Persia, contain six times as much salt as ordinary ocean water. All seas and lakes, such as the last four mentioned, which are more or less enclosed and from which there is a great evaporation and very little rainfall are distinguished by their intense saltiness, and consequently high density. Ingenious figures



An under-water picture of the barnacle, a creature that exists in the sea in countless millions, and attaches itself to every stationary or slow-moving thing; the bottoms of ships, and even the bodies of whales, become encrusted with them.

The Sea and its Story

have calculated that if the salt contained in the waters of the oceans and seas could be separated from them and spread over the land surface it would make a layer over thirty feet deep.



Patent Pictorial Agency

The machine by which the deep-sea sounding lead is worked. It is the invention of Lord Kelvin, and with it soundings of three, four, and five miles can be made.

Sea water is much more transparent than river water. Light penetrates it to a depth of about 60 feet. This transparency of sea water, like its saltiness, increases as one travels further from shore, and is generally greater in the higher than in the lower latitudes, though there are exceptions to this rule. In the Caribbean Sea zoophytes and sea plants growing on a bottom 30 feet deep are clearly visible from the surface on calm days, and it is even asserted that in some Northern seas the bottom may be seen at a depth of from 4,000 to 5,000 feet.

The colour of the sea is continually changing, and is chiefly caused by filtration of the sun's rays through the innumerable

small particles held in suspension in the water. Placed in a glass sea water appears perfectly transparent and colourless, but when gathered in a large mass it reveals a number of beautiful colours, the most common, as everybody knows, being a fine azure blue or ultramarine. On a clear and calm day this tint softens insensibly with distance until it melts and is lost in the blue of the heavens. The Mediterranean, which we have just seen to hold an unusual proportion of salts, is blue to excess. Most arctic explorers describe the Polar Seas as of a brilliant ultramarine blue. "Vivid blue" best paints to the mind the waters of the Equinoctial Atlantic; while the waters of the Pacific, as a rule, approach more nearly to indigo. As one nears the shore the colour of the sea changes and becomes more of a green or glaucous tint, the green in some cases being so intense as to appear black. Any disturbance of the surface will, of course, produce a difference in colour. There are days when the ocean assumes a grey or livid aspect, and others when it becomes a very pure green. When the sea is agitated the green takes a brownish hue. Beneath a calm sunset the surface will be lit up with all manner of delicate tints—pink, topaz, emerald green, amethystine purple.

Many local causes influence the colours of the shallower seas, and give them certain decided and constant shades. A bottom of white sand will give a greyish or apple-green colour; of chalk, a pure clear green. When the sand is yellow the green will naturally appear more sombre. The presence of rocks is often announced by the deeper colour which the sea takes around them. In the Bay of Loango the waters appear of a deep red, from the red bottom. The Red Sea owes its colour to minute algae floating in countless numbers. The same effect is produced off the coast of New Zealand by floating animalecules, which the fishermen call "whales' spawn," for no reason at all except that it pleases them to do so. Whales, being mammalian animals, do not

spawn like fish, but bring forth their young alive. Sea water concentrated in the salt marshes in the south of France by the heat of the sun is also red ; this, again, is due to the presence of a red-shelled animal of microscopic size. The red salt lakes on the watershed of Great Thibet are said to owe their colour to the same cause. These tiny creatures do not appear until the salt water has attained a certain concentration, and they die when it reaches a further density.

The sea on the coast of Japan appears yellow, green is the colour to the west of

tinge around the islands of the Grecian Archipelago. The White and Black Seas seem to be named after the ice of the one and the dark tempests which agitate the other.

The phosphorescence of the sea is a spectacle at once imposing and magnificent. A ship, in plunging through the waves seems to advance through a sea of bright flame, which is thrown off by the stern and sides like so much lightning. Myriads of phosphorescent creatures float and play on the surface of the waves, so as to form one vast field of fire. In



The deep-sea sounding apparatus at work on one of the Navy's "prospecting" ships. The depth is recorded by an ingenious chemically-prepared tube, into which the sea-water is forced by the pressure of the depth to which it descends. The amount of water that has entered the tube indicates the depth.

the Canaries, and black around the Maldive group of islands ; by Callao, the port of Lima, in Peru, it is olive-coloured ; while near Cape Palmas and along the Gulf of Guinea a ship sometimes seems to be moving in a sea of milk. The Mediterranean itself sometimes takes a reddish

stormy weather the luminous waves roll and break in a silvery foam. Glittering particles, which might be taken for sparks of living fire, seem to pursue and catch each other—lose their hold, and dart after each other anew. From time immemorial the phosphorescence of the

sea has been observed by navigators. The luminous appearance presents itself on the crest of the waves, which in falling scatter it in all directions. It attaches itself to the rudder, and dashes against the bows of the vessel. It plays round the reefs and rocks against which the waves beat, and on silent nights in the tropics the effects are truly magical. This phosphorescence is due for the most part to the presence of a multitude of creatures which float on or just under the surface of the water. They are of widely different form and structure, and belong to many families and species. Jelly-fish, larval crustaceans, animaleuke, all contribute their quota of glory. Among the most remarkable molluses met with are several species which present the appearance of a sort of mucous sac of about an inch long, which, thrown upon the deck of a ship, emits a light like a rod of iron heated to a white heat. Sir John Herschell noted on the surface of calm water a very curious form of phosphorescence; it was a polygon of rectilinear shape, covering many square feet of surface, and it illuminated the whole region for some yards with a vivid light, which traversed it with great rapidity. The probability is that this was a huge jelly-fish. Phosphorescence can be observed on almost any sea on a calm summer night, but it is seen at its best in the tropics, the Southern seas, and in the open Atlantic.

The phosphorescence of the sea may also result from another cause. When animal matter is decomposed it becomes phosphorescent. The bodies of certain

**The Wonder
of Luminous
Waves**

fishes, when they become a prey to putrefaction, emit an intense light. Animal matter

in a state of decomposition, proceeding from dead fish, which floats on the surface of ponds is capable of producing large patches of oleaginous matter, which, piled upon the water, communicates to a considerable surface, especially when the water is agitated, a phosphorescent appearance. The quite brilliant dis-

plays of phosphorescence, which can be witnessed as near London as Leigh on the Thames Estuary, are probably caused by decomposing animal matter brought down by the river. It is to be seen at its best when the tide is on the ebb on a hot summer night.

But we have discussed the characteristics of the ocean enough; let us get back to the great mass of water itself.

The Five Great Oceans

Although for convenience we divide it into many parts under the names Atlantic, Pacific, Indian, Arctic, Antarctic, it is most important to remember that the ocean is really one and indivisible. Its waters flow around the globe in obedience to a law which we may compare with the law of the circulation of the blood in our bodies.

This great oceanic circulation—first discovered by Dr. Carpenter—may be briefly explained thus: As everybody knows, most substances, solid, liquid, and gaseous, are expanded by heat and contracted by cold. Now, since it is extremely cold at the North and South Poles, the water there continually shrinks and contracts, and thus its level is lowered. But one sheet of water, like the ocean, cannot stand at different levels. Therefore, as the level is lowered at the poles, the water from warmer regions runs in to bring it up to its proper height again. This in turn contracts and becomes denser, and so much heavier than the water in warmer regions that a portion of the lower part must flow away from the poles.

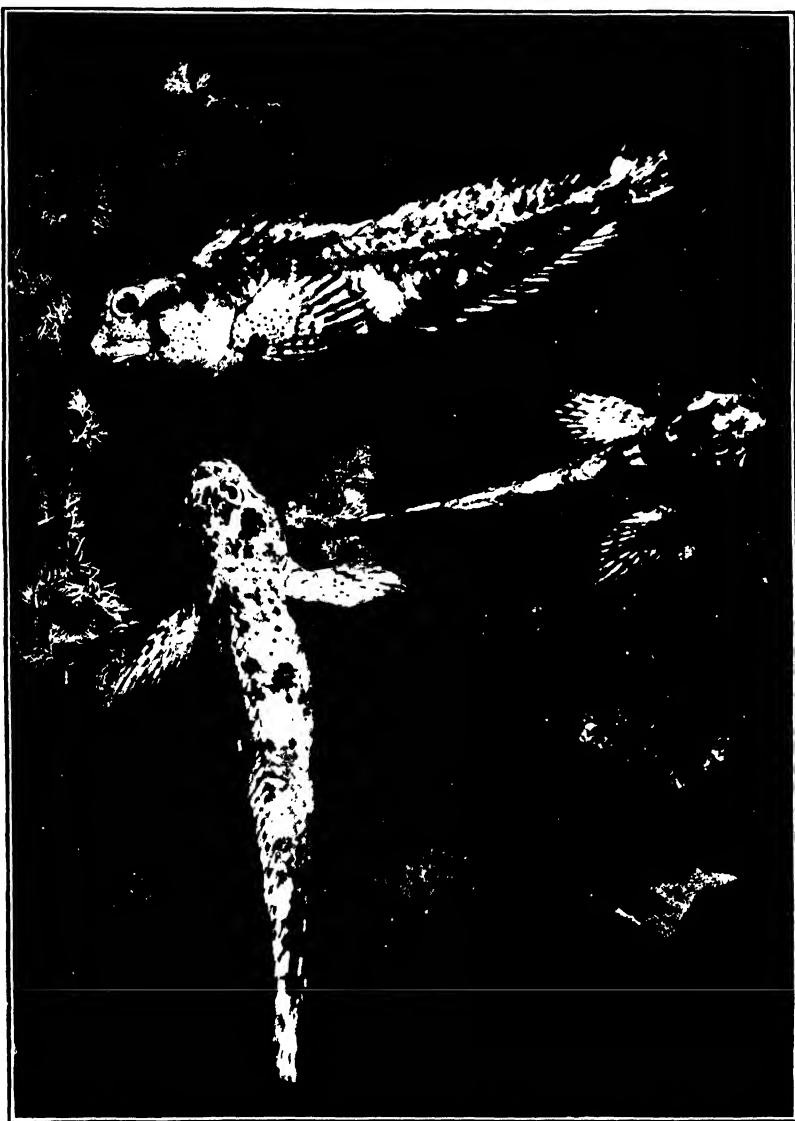
Thus we have two constant tendencies. In the first place, the level at the poles is ever being lowered and drawing in water from the warmer regions. In the second place, as that water flows in and is cooled down, the whole mass of water at the poles becomes so heavy that its lower part is pressed out again towards the equator.

And so we have two constant currents: (1) an inflow from the equatorial towards the Polar regions *on the surface*, (2) an

outflow from the polar regions towards the equatorial *at the bottom of the sea.*

But once more, as everybody knows,

therefore, the great surface current from the equator to the poles does not move quite due north and south, but has an



An interesting under-water photograph of a group of those fairly common shallow-water fish, the Blennies.

our globe is always spinning eastwards on its axis, and gives an easterly spin to the waters that it carries. In the equatorial regions, where the globe is widest, this motion is faster, of course. And,

easterly twist in it owing to the excess of easterly momentum it brings from that part of the world where its rotation was more rapid. On the other hand, the outflow from the poles towards the equator,

since it comes from a part where the rotation is less rapid, will (so to speak) get left behind by the faster-spinning earth, and gradually drift towards the west.

Such is the great theory of the ocean's



A remarkable photograph of a medusa or jelly fish, which floats usually at the surface. These creatures often emit phosphorescent light.

circulation—one of the most important discoveries of modern science.

The other great movement of the water is visible to us as an alternate rising and lowering of the surface of the sea adjacent to the land, an effect which, in reality, is world wide, and is produced by two pairs of waves which travel round the earth every day—a greater pair of waves caused by the attraction of the moon, and a smaller pair caused by the sun. The greater pair of waves which form the lunar tide take a lunar day (*i.e.*, twenty-four hours and fifty-four minutes) in travelling round the earth. The smaller pair of waves, caused by the sun, take only twenty-four hours to get round. It thus sometimes happens that the crests and

the depressions of the solar and lunar waves coincide. When this happens we have what are called "spring tides," in which, owing to the union of the two waves, the waters advance to their greatest height at the flood, and retreat farthest at the ebb. The spring tides are followed after a certain number of days by neap tides, in which the rising and falling of the water is least. This comes to pass because the solar tide travels quicker round the earth than the lunar tide, and accordingly gains upon it day by day, until in about six or seven days after spring tides the crest of the solar wave has advanced into the depression of the lunar wave and partly fills it.

The reason why the lunar tides are greater than the solar is simple enough. The moon is so close to the earth—at a distance 400 times less than the distance of the sun—that, although the whole force of the moon's attraction is small in comparison with the sun's, it is much more appreciably exerted. In fact, the moon, on this account, produces a tide about two and a-half times the height of the solar tide.

The spring tides, when the water rises higher and falls lower than at other times, occur at the new moon and at the full moon. At the first and last quarters of the moon we have the neap tides, when the water neither rises so high nor falls so low. At spring tides, as a matter of fact, the highest tide generally occurs, not on the actual day of the full or new moon, but a tide or two after. On the west coast of Ireland the highest spring tide is the third tide after the new or full moon. Along the English Channel, as far as the Straits of Dover, the highest tide is the fourth tide after the new or full moon; whilst on the River Thames it is the fifth tide after.

The reason is that the same tidal wave which causes high water on the west coast of Ireland takes another twelve hours to reach the Channel, and another twenty-four hours to reach the Thames.

The greatest spring tides of the year

occur about the time of the equinoxes; so that one looks for the highest tides about the end of March and the end of September.

The difference in the depth of the water between low water and high water is called the "range of the tide"; and this varies enormously at different parts of the coast. The eastern coast of Asia and the western coast of Europe have extremely high tides, while in the South Sea Islands the tides scarcely reach the height of twenty inches. In mid-ocean, again, the tidal rise and fall is very little, amounting, for instance, to a range of three feet at St. Helena. On the western coast of South America the tides rarely reach three yards; on the western coast of India they reach six or seven; and in the Gulf of Cambay they range from five to six fathoms. At London we find a tide of eighteen or nineteen feet. The most remarkable tides in the British Islands are those of the Bristol Channel, where, at Chepstow or Cardiff, they rise, during the "springs," to the height of thirty-seven or thirty-eight feet, and to a height of twenty-eight or twenty-nine during the "neaps."

The highest tide in the world occurs in the Bay of Fundy, which opens up to the south of the isthmus uniting Nova Scotia and New Brunswick. There the waters rise fifty, sixty, and even seventy feet, while in the bay to the north of the same isthmus they rise no higher than seven or eight feet. It is related that a ship was once cast ashore upon a rock during the night, and when day broke the crew found themselves suspended in mid-air just fifty feet above the waves!

A very curious tidal phenomenon is known as the "Fagre," or "Bore," and is thus accounted for: If a river subject to very high tides gradually expands towards the sea into a broad mouth, the broad tidal wave which enters it finds the banks continually



A curious creature known as a sea-urchin. Most of these Echinids live in shallow water.

narrowing. The consequence is that the water accumulates in the mouth more rapidly than it can flow up the river, and so becomes piled, as it were, upon itself in the form of a huge wave, or wall of water, several feet in height, which rushes violently up and meets the descending stream with such violence as in some cases to be accompanied with a noise like thunder.

Some celebrated *bores* that may be mentioned are those of the Tsin-tang in China, and of the Brahmaputra, Ganges, Hoogly, and Indus, in India. We may briefly describe that of the Tsin-tang. This attains its greatest magnitude opposite the city of Hang-Chow-Fu. Loud shouting from the craft in the river announces the appearance of the flood, which seems like a glistening white cable stretched athwart the bay as far down as the eye can see. Its noise, compared with that of thunder, speedily drowns that of the

boatmen ; and, as it approaches with prodigious velocity, it assumes the appearance of an advancing cataract, five miles across and about thirty feet high, which threatens to submerge all things afloat ; but they all vault, as it were, to the summit with perfect safety. This grand and exciting season is but of a moment's duration ; the wave passes up the river in an instant, but from this point with gradually diminishing force, volume, and velocity, disappearing entirely a few miles above the city. From ebb to flood tide the change is almost instantaneous ; a slight flood continues after the passage of the wave, but it soon begins to ebb.

This sudden change from low to high water appears to be a general characteristic of the bore ; indeed, it seems as if all the water of the flood-tide waited to accumulate itself into one heap, and then rolled in, in as many minutes as it usually takes hours.

The times of high water are as various in different places as the range of the tide. Thus, when it is high water at Bristol at 5 o'clock in the morning, the tide does not reach its height at London Bridge until noon, and it will not be high water at Hull until 4 o'clock in the afternoon. But if we take any particular place, we shall find that high water always occurs there at very nearly the same time at *full and change*, as it is called —that is to say, at full moon and new moon ;

and the times of high water at full and change are called "tide constants." These "tide constants" will be found marked on the chart in various places, so that if one knows from one's almanack how old the moon is, one can calculate (remembering that high water occurs about forty minutes later each day) at what time it will be high water at that place on any particular day. For instance, the average time of high water at London Bridge at full and change is a quarter to two. On the day after the new or full moon, it will be at half-past two ; on the next day, at a quarter-past three ; and so on. For each day you add forty-five minutes.

It is fitting that this article should conclude with some mention of the abounding life of the seas and their relation to human marine adventure. The herring has been the strength of more than one kingly city upon the North Sea in the past, and to-day a dozen great towns on the East coast of Britain—between the Shetlands and Lowestoft—live by catching some of the countless millions of the vast herring army.

The scientist, as has been hinted, has still vast fields for research in the sea, and not the least important questions to be answered are those dealing with the "manners and customs" of the many valuable food fish, about which, at present, practically nothing is known.

E. H. R.



The Battle of St. Vincent

THE command of the sea, on which Britain's peace, prosperity, greatness—nay, her very life itself—depends, has not been lightly won. It was the result of long years of struggle marked out into epochs by convincing victories.

The year 1795—the second after the declaration of the Great War—witnessed the entrance of two great figures upon the stage of Europe. The name of the one was Napoleon Bonaparte, who during the winter was sent out by the French Directory to command the army of Italy. The other is not so well known. Yet it was he who turned the British navy into that weapon which Nelson afterwards wielded with such tremendous effect, and who laid down that policy for it which led up to Trafalgar and decided the issue of the war. This man was Admiral Sir John Jervis, who on the 30th of October arrived in the bay of San Fiorenzo to take over the command of the Mediterranean Fleet.

He found that fleet in anything but a good condition. The date, you must remember, is but two years earlier than that of the great mutiny at the Nore. Neither had the British naval policy been very successful during the first two years of the war. The fact was, we were led by Lord Howe, and Lord Howe was an old man and a formalist. His policy was to *economise* his fleet; to keep it but sparingly at sea, and then mainly for purposes of drill and manœuvre; to shut up the French fleet in Brest, and watch it from one of our own Channel ports. Apart from all strategic con-

siderations, this practice had a bad effect upon the fleet itself. To be sure, it saved the ships much wear and tear, which they would have been exposed to by cruising about in heavy weather while the French lay snugly at anchor in port. But, as Sir John Jervis saw, and Nelson after him, this benefit to the ships was as nothing compared with the injury done to the men. Writing from Lisbon in December, 1796, Jervis says: "I will not lie here a moment longer than is necessary to put us to rights; for you well know that inaction in the Tagus must make us all cowards." The seamen in Howe's day had many and great grievances; but undoubtedly his practice of keeping them loafing at anchor in home ports sapped the morale of the Channel Fleet, gave them time to reflect on their woes and breed sedition, and contributed to the lamentable mutinies of 1797. Such mutinies do not happen among men who are kept habitually at sea and on the alert for an enemy. One remembers, again, how Cornwallis stopped the disaffection that arose on board the *Canada* on account of some accidental delay in the payments. His crew signed a round robin declaring that until they were paid they would not fire a gun. "My lads," said Cornwallis, "the money cannot be paid till we return to port, and as to your *not fighting*—why, I'll clap you alongside the first large ship of the enemy I see, and then the devil himself cannot keep you from it!"

Jervis, and Nelson after him, were to introduce a different discipline and a different policy. And yet Sir John Jervis, when he assumed command of the Mediterranean Fleet, was a man in his sixty-

second year. Born in 1734, he was as yet almost unknown outside the service. In his own profession, however, he had long been a marked man. The child of a poor though a well-born family, he had in early life, under the pressure of poverty, required of himself the same stern discipline and submission to the duty of the moment

**A
Picture of
Jervis**

which he afterwards so rigorously exacted of others. Grave and unbending in his official

relations, immovable as a rock when his determination was once formed, unrelenting almost to mercilessness in suppressing insubordination, then rife throughout the British navy, he had the high-bred polish of a man used to good society, and his demeanour was courteous and, when occasion demanded, even courtly. A traveller by land as well as by sea, a constant and judicious reader in a period when such habits were rarer than now among seamen, he was well informed in matters other than those relating merely to his profession. Of the latter, however, he was a master.

Such was the character of the man who now took command of the Mediterranean fleet. He was determined to make this fleet a model, and he did. He had good captains to help him, Nelson being one. But he had a hard fight before he could obtain his reward, and almost at the outset received a blow which might have disheartened any man, for it lowered the prestige of England in the eyes of the whole world. He was ordered to evacuate the Mediterranean.

It happened in this way. Bonaparte was in the full career of his Italian successes, and these successes had greatly reduced the weight and influence of England in the Mediterranean. To add to our difficulties, it became apparent that Spain was fast becoming hostile, and would sign an offensive alliance with France against us. Now Spain had a navy of over fifty sail of the line, and nobody yet knew how rotten this navy was. Jervis, at any rate, had only

twenty-two ships—splendid ships though they were—and of these seven were with Admiral Mann off Cadiz, and a thousand miles from the main body off Toulon. Naturally he feared that the combination of France and Spain would be too much for him, and, as a precaution, he sent orders to Mann to rejoin him. Had Mann done so, the course of history during the next few years might have been very considerably changed. The Government at home was vacillating, unable to make up its mind whether to clear out of the Mediterranean or not. But in the Mediterranean the best men were confident that the British fleet ought to stay. "Do his Majesty's Ministers know their own minds?" Nelson asked indignantly. "They at home do not know what this fleet is capable of performing anything and everything. Much as I shall rejoice to see England, I lament our present orders in sackcloth and ashes, so dishonourable to the dignity of England, whose fleets are equal to meet the world in arms; and of all the fleets I ever saw, I never beheld one, in point of officers and men, equal to Sir John Jervis's, who is a commander-in-chief able to lead them to glory." Sir Gilbert Elliott, governor of the island of Corsica, which had now belonged to England for a year or two, and was our base of operations in the Mediterranean, felt the ignominy of evacuation even more deeply. "The Admiral," he wrote, "is as firm as a rock. He has at present fourteen sail-of-the-line against thirty-six, or perhaps forty. If Mann joins him they will certainly attack, and

**The
Chances of
Victory**

But Mann did not join. He was a gallant officer with a good record; but on this occasion he made a fatal blunder. He seems to have got it into his head that the chances of Great Britain in the Mediterranean were, for the moment at any rate, hopeless. He did, indeed, start with great haste—with such haste that

he forgot the necessity for stores, and left Gibraltar without filling up. He was sent back at once, with orders to fill up and return as quickly as possible. On his

to have determined him that to return to Jervis was useless, if not impossible. On reaching Gibraltar he consulted his captains, and, finding they concurred



The *Minerve*, having outsailed her consort, fell in with a Spanish frigate, the *Sabina*, and engaged.

way back he was chased by a Spanish fleet of nineteen ships-of-the-line under Admiral Langara. His squadron escaped, losing only two merchant vessels which it had under convoy. But this accident seems

with his opinion, sailed straight off for England in flat disregard of the commands of both Jervis and the Admiralty. He was never employed afloat again.

His defection, let it be remarked, had

no bearing on the evacuation of Corsica, which the British Government had determined on as soon as ever Spain declared war. Indeed, the order to evacuate the island had reached Jervis as far back as the 25th of September. But it had the most important bearing on the position of our fleet in the Mediterranean. It weakened Jervis's forces at the most critical moment, and not only made it impossible for the Admiral to strike a blow at the Spanish fleet, but rendered it extremely dangerous to keep the station at all.

On the 29th of September he sent Nelson to superintend the evacuation. He himself held on until the last moment in San Fiorenzo Bay, hoping against hope that Mann might still join him. But provisions were running short, and by the 2nd of November it became impossible to delay. On that day, therefore, the British fleet weighed anchor, and did not reach Gibraltar until the 1st of December, 1796; and thus the Mediterranean was left without a single British line-of-battle ship cruising in its waters. On his way the Admiral was met with orders from home countermanding the evacuation, if not yet carried out. But it was now too late.

There can be no doubt of the severity of the blow thus dealt to British prestige. "The expulsion of the English," wrote Bonaparte, "has a great effect upon the success of our military operations in Italy. . . . It has the greatest moral influence upon the minds of the Italians, assures our communications, and will

**What
was
Wanted** make Naples tremble even in Sicily." "The British fleet," says Captain Mahan, "had

been three years in the Mediterranean, and since the acquisition of Corsica had effected little. What was needed at the moment was not an abandonment of the field, but a demonstration of power by a successful battle. The weakest eyes could count the units by which the allied fleets exceeded the British;

acts alone could show the real superiority, the predominance in strength of the latter."

On reaching Gibraltar, Jervis received orders to take his fleet up to Lisbon, where it was believed that the French and Spanish Governments meant to attack Portugal, by forcing the entrance to the Tagus by a squadron from Brest.

Nelson and his Frigates

Before sailing, he sent Nelson back up the Mediterranean with two frigates to bring off the garrison and stores from Elba.

It might be thought that Sir John Jervis had reason enough already to curse his unlucky star. But now befell a series of accidents that might well have broken any man's spirit, for by them his fleet was reduced from fifteen ships-of-the-line to ten, with which number he reached the Tagus.

He expected reinforcements, however; and on the 6th of February there arrived five sail-of-the-line and one frigate, which had been detached to him from the Channel Fleet. Thus reinforced, the Admiral had under his command the following: 100-gun ships, *Victory* (flagship) and *Britannia*; 98-gun ships, *Barfleur*, *Prince George*, and *Blenheim*; 90 guns, *Namur*; 74's, *Captain*, *Goliath*, *Excellent*, *Orion*, *Colossus*, *Egmont*, *Culloden*, *Irresistible*; 64 guns, *Diadem*.

It will be seen that these five new ships did no more than make up the number Jervis had with him at Gibraltar when he sent home asking for reinforcements; and now yet one more accident very nearly cost him another ship. Early in the morning of the 12th of February, it being quite dark, the *Colossus* and *Culloden* came into collision. The former escaped with trifling damage, but the *Culloden* fared differently. The knee and cheeks of her head, the headrails, larboard cathead, bowsprit-cap, bimini, jib-boom, and fore-topgallant-mast were entirely carried away, and the bowsprit itself was badly sprung. In any other circumstances a ship in this state of disablement would



At the height of the chase a man fell overboard, and a boat was lowered to pick him up.

have steered for the nearest port. But Troubridge of the *Culloden* was one of the most gallant men in the fleet ; and his crew worked with fury rather than lose the chance of distinction likely soon to be afforded. To the surprise of all who had seen her as day broke, that same afternoon she was reported again ready for service.

Meanwhile, what had become of Nelson, who was to bear so splendid a part in the coming fight ? We have seen that Jervis sent him back from Gibraltar to bring off the garrison and stores from Elba. He sailed from Gibraltar on the 15th of December, on board the *Minerve* frigate of 42 guns, accompanied by the *Blanche* of 32 guns ; and arrived at Porto Ferrajo, Elba, on the 26th, having fought on the way a small action which would have made the reputation of an ordinary man. In brief, the *Minerve*, having out-

sailed her consort, fell in with a Spanish frigate, the *Sabina*, and engaged. After an action of three hours, during which the Spaniards lost 16½ men, the *Sabina* struck. The Spanish captain, her only surviving officer, had hardly been carried on board the *Minerve* when a second Spanish frigate, the *Matilda*, came up, compelled her to cast off the prize, and brought her a second time to action. After half an hour's trial of strength this new antagonist wore and hauled off, and would have been taken had not three other Spanish ships hove in sight. As it was, Nelson had now the utmost difficulty in getting clear ; but he managed it, and reached Porto Ferrajo on the 26th. Meanwhile the *Blanche* had engaged another of the Spanish frigates, the *Ceres*, and had forced her to call for quarter and haul down her colours ; but she, too, had to leave her prize and run for Elba.

Nelson remained at Elba a month, embarked the naval stores, and sailed to rejoin Jervis on the 29th of January, 1797, taking with him the frigates, store-ships, and transports which had been left at Elba. The one desire of his heart was now to reach the fleet in time for the battle which he knew to be imminent. He arrived at Gibraltar on the 9th of February, heard that the whole Spanish fleet had passed outside the Straits, and hurried on, crowding all canvas. At the very mouth of the Straits he sighted the Spanish fleet, and was sighted and chased by two ships of war. In the very height of the chase a man fell overboard from the *Minerve*. A boat was lowered and picked him up, but the enemy's ships were now close, and to wait for the return of the boat seemed likely to involve the loss of the frigate. But Nelson did not hesitate. "I won't let Hardy go," he said; and he backed the top-sail, and succeeded in picking up the boat and carrying him off. This was the Hardy who afterwards, as captain of the *Victory*, knelt by Nelson's death-bed at Trafalgar. On the 13th Nelson sighted the English fleet, reported that the Spaniards were near, and was ordered by Jervis to hoist his broad pennant (the distinguishing flag of a commodore) on board the *Captain*. What he did next day on board the *Captain* we shall presently see.

Sir John Jervis, when Nelson fell in with him, was cruising with his fifteen ships off Cape St. Vincent, knowing that there he must meet any squadron of the enemy, from either the Mediterranean or

St. Valentine's Eve the Atlantic, bound for Cadiz. On receipt of Nelson's news he ordered the signals to

the frigate *Niger* came in and reported him as lying not more than ten or twelve miles distant to the south and west. The wind, which had blown strongly from the south-east, now shifted to west by south, bringing up some fog with it. Day dawned at about 6.30—it was St. Valentine's Day—and revealed the grand fleet of Spain looming out of the mist, not twenty miles away, in number twenty-seven sail-of-the-line

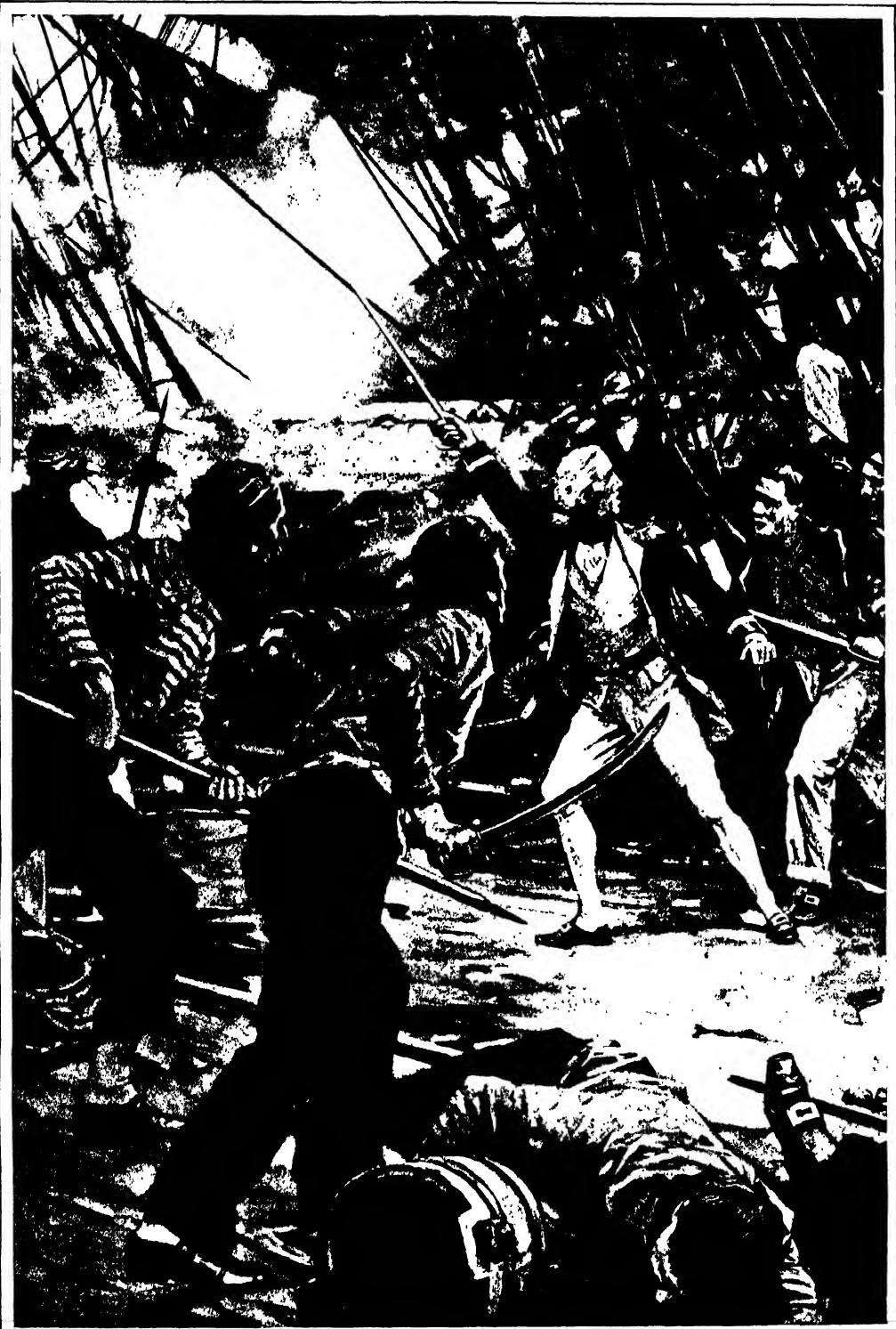
Against Great Odds

to the British fifteen. Jervis was tramping up and down the *Victory*'s quarter-deck as successive reports were brought to him from the mast-head. "There are eighteen sail-of-the-line, Sir John." "Very well, sir." "There are twenty sail, Sir John." "Very well, sir." "Sir John, there are twenty-seven sail-of-the-line; nearly double our own." "Enough, sir; no more of that, sir; if there are fifty, I'll go through 'em." "That's right, Sir John," said Hallowell, his flag-captain, "and a rare good licking we'll give them."

Hitherto we have been following the British fleet. We must now turn aside for a moment and speak of the Spaniards, and how they came to be off Cape St. Vincent on this morning of the 14th of February.

When Jervis left Gibraltar the grand fleet of Spain, under Admiral Langara, was lying in Cartagena harbour. It remained there for nearly two months, during which time Langara was superseded by Admiral Don Josef de Cordova. Now the project of the French Government was to mass this fleet with their own at Brest, in order, if occasion offered, to make a great united descent upon England. As a step towards this, it desired the Spanish fleet to move around from Cartagena to Cadiz; and at length, under urgent pressure, Admiral Cordova set sail down the east coast of Spain and out through the Straits. Passing Gibraltar on the 5th of February, they were overtaken by strong easterly weather, which drove them far out to

be made for the British fleet to prepare for battle and keep in close order during the night. All through that night the signal-guns of the distant Spaniards were distinctly heard. At half-past two in the morning there came a Portuguese frigate with information that the enemy was only five leagues to windward. At five o'clock



Nelson rushed on board the *San Josef*, shouting "Victory or Westminster Abbey!" In a few moments he had carried the ship.

westward. On their way they were spoken by an American ship, which had passed through the British fleet on the 4th, before its reinforcement had come, and while the *Culloden* had temporarily parted company, and which reported (as was true enough at the time) that Jervis had with him but nine sail-of-the-line. The shift of the wind during the night of the 13th enabled the Spaniards to head for Cadiz. They now numbered twenty-seven ships-of-the-line, besides twelve 34 gun frigates and one big corvette.

In passing the Straits, Cordova had despatched three of his ships—the *Neptuno*, *Bahama*, and *Terrible*—to escort a quantity of troops and stores into Algeciras. It was on their way to catch up with the main body, after this service, that two of these ships caught sight of Nelson returning in the *Minerve* and chased him, as has been told.

The Spanish fleet was crowding all sail to make for the land, when morning broke and half-revealed the British in the fog. During the night Jervis had formed his ships into two columns of seven and eight respectively, and his captains kept such admirably close order that even he, the most exacting officer in the service, could not forbear to praise. At first the Spaniards could only see one of these columns in the fog. This confirmed their belief in the information that the Americans had given them that Jervis had only nine ships. They did not want to fight, but they thought they could despise such an enemy; and for some time the great fleet held on in its ragged and

The Spanish Disorder slovenly order. In the eagerness to get to port, and in their confusion owing to

the shift of the wind, the Spaniards were broken into two bodies. Of these the leading one, composed of six ships, was most to leeward, and sailing nearly straight before the wind. Then came a gap of something like eight miles, and then the straggling windward division of twenty-one ships.

For some time they held on thus; but after awhile their look-out ship began to make disconcerting signals. The captain of this ship, perhaps because he believed in a little gentle exaggeration, or perhaps annoyed that so little notice was taken of the previous signals, now ran up the information at his mast-head that the British fleet consisted of forty sail-of-the-line! The absurdity of this signal and the hopeless perplexity into which it at once threw the whole fleet are good evidence of the rotten state of Spanish seamanship at that time.

The Battle is Joined

About ten o'clock the fog lifted and showed Jervis his opportunity—the great Spanish fleet broken into two ill-formed bodies, and his own two columns moving down in perfect order straight for the gap between them. And now the Spaniards too, began to realise their position; and the six lee ships hauled up close to the wind on the port tack to try to run back to their fellows and close the gap. Jervis promptly formed his two columns into one; that is to say, into the fighting order of battle. He had already ordered six of his ships to hurry in chase—the *Culloden*, *Blenheim*, *Prince George*, *Orion*, *Colossus*, and *Irresistible*; and the advanced position of these ships now gave them the honour of leading the British line in the order given. Behind them came Jervis himself in the *Victory*, and after him the *Egmont*, *Goliath*, *Barfleur*, *Britannia*, *Namur*, *Captain*, *Diadem*, and *Excellent*.

Very soon it became apparent that the lee Spanish ships could not cross the bows of the British in time to close up the gap. For a moment they seemed about to give up the attempt and run for land. One, indeed, did do so, and disappeared; but the remaining five held on.

The impossibility of closing the gap became equally apparent to the Spanish weather division. Three ships held on and crossed under the bows of the British column, thus passing over to the lee division, which now numbered eight. The rest tacked to the northward in confusion—

several of the ships doubling upon each other, and some lying three abreast so that they could not fire on the British without damage to each other.

Thus the Spanish weather division began to run in a direction almost parallel to that of the British column, but distinctly opposite. At 11.30 Troubridge in the *Culloden* came abreast of their leading ships, and, by signal from the

Troubridge had divined—good seaman that he was—what was passing in his commander's head. Already he had hoisted at the mast-head of the *Culloden* his answering signal, rolled up in a bundle and needing but a turn of the wrist to shake it loose. Hardly did the signal fly from the Admiral's ship before his answer fluttered out, and the *Culloden*'s sails shook as she luffed up in obedience.



The Spanish fleet was crowding all sail to make for the land when morning broke and half revealed the British in the fog.

Admiral, opened fire with his starboard guns, taking, as he ran past, a fire in return from those Spanish ships which could open their batteries without firing on a friend.

Jervis thus had his enemy broken in two, and the question for him now was, Shall I attack the larger division or the smaller? He reasoned that the smaller, or lee division, having to beat up to windward, could be kept out of action longer. Wisely and boldly, therefore, he determined to attack the larger division, and ordered the signal to be made to tack in succession and pursue the weather ships.

"Look at Troubridge!" shouted Jervis. "He handles his ship as if the eyes of all England were upon him. And would to God they were!"

As the *Culloden* rounded, ship after ship of the British line tacked in her wake and followed. Six ships rounded thus. Then came the *Victory* and the eight ships behind her still holding their original course of south by west. As the *Victory* bore down, the leading ship of the Spanish lee-line came up into action at last, and tried to pass ahead of her and cut her off. But the *Victory* was a fast-sailing ship.

She now proved too quick for the Spaniard, who, to avoid colliding, was forced to tack close under her lee, and caught a raking broadside, that put him out of action almost as soon as he had entered. The *Victory*, which had backed her topsail in order to take aim more prettily, now stood on and tacked after the six

**The
Grand Old
Victory**

leading ships, the rest of the British column following her in their order.

Now let us quote that admirable naval historian, Captain Mahan : " It was now nearly one o'clock. The action so far had consisted, first, in piercing the enemy's line, cutting off the van and greater part of the centre from the rear ; and, second, in a cannonade between two columns passing on opposite parallel courses—the Spanish main division running free, the British close to the wind. Naval history abounds in instances of these brushes, and pronounces them commonly indecisive. Jervis, who had seen such, meant decisive action when he ordered the *Culloden* to tack and follow the enemy. But a stern chase is a long chase, and the Spanish ships were fast sailers. Some time must pass before Troubridge and his companions could overtake them ; and as each succeeding vessel of the British line had to reach the common point of tacking, from which the Spaniards were steadily receding, the rear of Jervis's fleet must be long in coming up." Nor could Jervis afford to tack all his fleet at once, because his rear ships had to keep the Spanish lee division in check, in order to carry out his plan properly.

Still there was the imminent danger that, as the English column ran down to the tacking-point, the Spanish main division would slip round behind it and unite with the lee division. If this should happen, farewell to all chance of victory !

Fortunately, there was a man of genius in the British fleet. The *Captain* was the third ship from its rear, and from her quarterdeck Nelson saw the danger and the one chance of stopping it. Without a

moment's hesitation he disobeyed the signal flying from the flagship, wore the *Captain* round as she stood, and flung her, alone and unsupported, full in front of the enemy.

It was a daring and a splendid move. It brought him at once into action with no less than six Spanish ships, including the vast *Santissima Trinidad*, the largest ship-of-war afloat ; but it stopped the Spanish flight and gave Troubridge and the leading British captains time to come up. And it startled the Spanish main division and huddled it together like a flock of sheep.

Then began the last act of the drama. Nelson and Troubridge dear companions in arms bore the brunt of the Spanish fire for nearly an hour. The *Blenheim* (Captain Thomas Lennox Frederick) then passed between them and the enemy and gave them a respite, pouring in her fire upon the Spaniards. Two of Nelson's antagonists, the *Salvador de Mundo* and *San Ysidro*, then dropped astern and were fired into in a masterly style by Collingwood in the *Excellent*. This vessel—the rearmost ship of the British line had escaped all serious injury to her spars and was fully under her captain's control. The *San Ysidro* had struck, and the *Salvador* was believed to have done so. But Collingwood, disdaining the cheap honour of taking possession of these beaten ships, pushed on to where he saw his friend Nelson's ship lying badly disabled on the starboard side of the *San Nicolas* and within pistol-shot, " her fore-top-mast and wheel shot away, not a sail, shroud, or rope left."

**Nelson
in the
Captain**

and being fired at by five Spanish ships at once. With all sail set he ranged up between the *San Nicolas* and the *Captain*, passed within ten feet of the Spaniard, and poured in a tremendous broadside ; then went on for the *Santissima Trinidad*. The *San Nicolas*, on receipt of this destructive fire, luffed up (either by design or because her helms-

man was killed), and fell aboard the *San Josef*.

The coast was now clear again for Nelson. But what was he to do? He looked at his ship; it was impossible to manoeuvre her. Nothing was left but to board. As a preparative, the captain poured her larboard broadside, at less than twenty yards' distance, into the *San Nicolas*. As the smoke cleared a little Nelson ordered Captain Miller to put the helm astarboard. The *Captain* came up to the wind, fetched across to the *San Nicolas*, and hooked with her port cathead the Spaniard's quarter-gallery. Nelson, who had his men ready on deck, placed himself at their head, and gave the word for the most notable exploit of the battle. The British dashed on board the Spaniard, drove her crew below, and hauled down her colours. But on the other side of the *San Nicolas*, and fast locked to her, lay another Spaniard, the huge *San Josef*, of 112 guns. Her crew now opened a hot musketry fire upon the victorious boarders; but Nelson, having placed sentinels at the different ladders to prevent the men of the *San Nicolas* regaining their deck, sent to Captain Miller for a reinforcement, and rushed on board the *San Josef* shouting "Victory or Westminster Abbey!" In a few moments he had carried this ship also, and on her quarterdeck he received the swords of the Spanish officers. It is related that, as he did so, one of his sailors came up and shook him by the hand, taking no denial, but saying that he might not soon have



The soldiers fired into the stern gallery windows of the *San Josef*.

such another place to do it in, and he was heartily glad to see him there.

Here is Nelson's own account of the exploit: "The soldiers of the 60th, with an alacrity which will ever do them credit, and Lieutenant Pearson, of the same regiment, were almost the foremost on this service. The first man who jumped into the enemy's Mizzen-chains was Captain Barry, late my first lieutenant (Captain Miller was in the very act of going also, but I directed him to remain); he was supported from our spritsail-yard, which hooked in the Mizzen rigging. A soldier of the 60th Regiment having broke the upper quarter-gallery window, I jumped in myself, and was followed by others as fast as possible. I found the cabin-doors fastened, and some Spanish officers fired their pistols; but, having broke open the doors, the soldiers fired,

and the Spanish brigadier (commodore with a distinguishing pennant) fell in retreating to the quarterdeck. I pushed immediately onwards for the quarterdeck, where I found Captain Barry in possession of the poop, and the Spanish ensign hauling down. I passed with my people and Lieutenant Pearson, on the larboard gangway, to the fo'castle, where I met two or three Spanish officers, prisoners to my seamen; they delivered me their swords. A fire of pistols or muskets opening from the Admiral's stern-gallery of the *San Josef*, I directed the soldiers to fire into her stern; and, calling to Captain Miller, ordered him to send more men into the *San Nicolas*, and directed my people to board the first-rate, which was done in an instant, Captain Barry assisting me into the mainchains. At this moment a Spanish officer looked over the quarterdeck rail, and said they surrendered. From this most welcome intelligence, it was not long before I was on the quarterdeck, where the Spanish captain, with a bow, presented me his sword, and said the Admiral was dying of his wounds. I asked him, on his honour, if the ship was surrendered. He declared she was, on which I gave him my hand, and desired him to call on his officers and ship's company and tell them of it, which he did; and on the quarterdeck of a Spanish first-rate, extravagant as the story may seem, did I receive the swords of vanquished Spaniards, which as I received I gave to William Fearney, one

Nelson's Own Story of my bargemen, who put them, with the greatest *sang - froid*, under his arm.

I was surrounded by Captain Barry, Lieutenant Pearson, of the 69th Regiment, John Sykes, John Thompson, Francis Cook, all old *Agamemmons*, and several other brave men, seamen and soldiers. Thus fell these ships."

By this time four Spanish ships had been taken by the British, and the great

Santisima Trinidad lay in such a ruinous condition that many believed her to have struck. But the Spanish lee division was at length in a position to do damage, and many ships of the weather division were still uninjured. About four in the afternoon, therefore, Jervis reformed his fleet in line, interposing it between his prizes and the enemy. And so the battle ended. Nor, next day, though the fleets remained in sight of each other, did the Spaniards dare to risk an attack.

The Spaniards Cowed

The glory of the day must always be shared between Nelson and his commander. When the battle of St. Vincent is mentioned, people usually think of "Nelson's bridge," as it has been called —of his feat of boarding and capturing the two Spanish ships at one stroke. The inspiration of courage that led him to fling his ship, without orders and at the most critical point of the battle, in front of the whole Spanish line, is at least as memorable. But neither of these should be allowed to obscure Jervis's lustre. It was Jervis who, with a fleet of fifteen sail, attacked and defeated a fleet of twenty-seven. It was Jervis who had made the fleet capable of such a victory. And it was Jervis who saw that a victory just then was indispensable to England.

The revulsion was great. Rewards were showered upon the victorious fleet. Jervis was created a peer of Great Britain, by the titles of Baron Jervis of Meaford and Earl of St. Vincent, with a pension of £3,000 per annum. Vice-Admiral Thompson and Rear-Admiral Parker received baronetcies; and the remaining Vice-Admiral, the Hon. William Waldegrave, was appointed to a rich post abroad. Commodore Nelson became Rear-Admiral Sir Horatio Nelson, K.C.B., and received the freedom of the City of London. The thanks of both Houses of Parliament were voted to the fleet, and gold medals distributed to all the flag-officers and captains.

The Sailor Ashore

A

LMOST before Merchant Jack has sheeted home the topsails of his floating home, almost before the towboat has cast loose the hawser and the pilot has waved his last farewell to the outward bound vessel, Jack is calculating the possible amount of his pay, and is looking forward to the endless pleasures he will have ashore when the voyage is done. True, the ship having reached her final port, having tied up to wharves or dolphins, and the last visit to the shipping office having been paid, Jack passes through the swing doors of some public-house in the East India Dock Road, and thinks he has seen all London. He is ashore, and his horizon of enjoyment is bounded north, south, east, and west by dockland, its allurements and its temptations, its follies and its sordidness. For there is very little of real pleasure to be found — This is putting the matter in a few brief words; it may be possible to extend the

town in the world; the shore is not made attractive to Merchant Jack, and so he gets rid of his pay expeditiously, there being hundreds of reputed friends to assist him, and hies him away once more to sea, where, if the work be hard, the temptations and the hazards are assuredly less than are to be found on shore.



The fire burns brightly, and for a year probably he has not seen a fire, no matter how cold the weather may have been.

picture indefinitely. But be it understood that Merchant Jack ashore is not altogether a beautiful subject for discussion or observation. This fact is partly due to himself; but much more is it due to those legions of harpies

cut off from all intercourse with the shore; he is compelled to adhere strictly to temperance principles. Naturally enough, perhaps, this forced abstinence breeds unholy desires in his soul; the absent liquor becomes tenfold as alluring by reason of its very absence, so when an opportunity comes he takes advantage of it, and drinks copiously. Then, partly to drown his regrets at having overstepped the mark, he drinks again, and on the heels of this new debauch come the memories of what his life at sea holds for him: hard work, constant privations, suffering such as might sap away the life of the normal man. He shudders. In perspective the dangers he has overpast assume almost terrifying proportions; he knows full well that his next voyage will be fraught with equal dangers, equal discomforts. Meanwhile the pot-house bar is snug, the fire burns brightly, and for a year he has probably never seen a fire, no matter how



The Germans fled, but two of them were down and spurned aside.
On swept the victorious twa n.

and robbers who fatten on his very simplicity.

The merchant sailor is not by nature vicious, and very often he has the grace to be ashamed of his full-blooded orgies when ashore; but the fact is there: Merchant Jack is no Gospel temperance "white-haired boy." For periods of some three months at a time, perhaps, he is

cold the weather may have been; the liquor shines entrancingly in those large bottles behind the bar, and the tow-haired goddess, who smiles so amiably as she polishes the glasses, stands to him for all that is inaccessible in womanhood. She will certainly unbend sufficiently to pass the time of day with him; perhaps she will go so far as to have a glass with him. And remember

that Jack sees nothing of other women. He only knows two classes : what he calls decent women—unattainable, who draw their skirts aside when he passes, and the other kind. So Jack feasts his eyes on the redundant beauty of the public-house Hebe, feasts his soul on strong liquor ; and, because he can never get the smell of the sea out of his nostrils so long as he lives, foregathers with other deep-water men and yarns about the ships he has sailed in and the women he has loved.

It is a fact that well-meant efforts are made to turn Jack from the error of his ways, and lead him in those refined paths of peace that make for ultimate happiness. There are sterling souls who devote much time and real, earnest labour to the betterment of Jack's condition ashore, and I know dozens of sailors who bless the names of these missionaries. But usually Jack shuns the missions and mission-halls, for sometimes those who cater for his soul's welfare are apt to be a little too condescending, too apt to look on these brands as something worth saving, but not worth being treated as human beings.

" You have a soul, and it shall be saved," said one earnest devotee to a very able seaman in the writer's hearing. " I will save it. You are racing down the path that leads to destruction."

" Well, my bloomin' soul's me own, ain't it ? " asked the sailor. " Don't be so durned interferin'. What about your own soul, mister ? Ain't that about as much as the average man can tackle in a lifetime ? " And he left the ragged billiard-tables, the harmonium, and the rows of

**The Soul
of Merchant
Jack**

Sankey and Moody's hymn-books, left the snug air of righteousness, and fared him further to the well-lit halls of laughter and lightsome revelry. Jack faces his Maker too often in everyday life to expect Him to be shadowed forth for his observation as a Being of grim, relentless ferocity, such as is the Deity usually served up at these waterside halls.

As an example of the gloomier side of the

picture, let me cite a case that came under my own observation. The place was a well-known Colonial port ; the actors two able seamen, both Britons, afloat as fearless as bulldogs, smart men aloft, daring beyond belief. Ashore they were two unsophisticated children, ready to fraternise with the first man who came their way, ready to swear undying friendship with any individual who would

**Beginning with
Good
Intentions**

imbibe the liquor for which they paid with an open-handed generosity. These two men went ashore one Saturday night in this port, well-dressed, strictly sober, and avowedly of the intention of attending a mission service near by. They had not a particle of vice in their constitutions ; all they wanted was a little peace, a chance to walk on firm earth, and to associate with their fellow men.

They were welcomed to the hall, and first of all were asked to sign the pledge. Because they were strictly intending to be temperate in all things, they did so. They were rejoiced over, and they were referred to openly as burning brands. Then they were regaled with a hymn full of woe ; they were prayed over ; they were told that even they might hope for a better life if only they continued to sing those lugubrious hymns and kept those pledges. Then they were invited to play Snap with two ladies who had never smiled naturally since they were born. That was the limit.

" Let's get out of this," said Smith, and Jones agreed. They went forth, still determined to be sober. It was a chilly night ; a thin drizzle was falling ; the streets were even more uninviting than the gloomy mission-rooms, where, on account of lack of subscriptions, gas was used sparingly. Across the road flared the lights of a public-house : the place reeked of warmth and comfort.

" We won't go in there," said Smith firmly.

" Wouldn't go in if I was paid," said Jones stubbornly, and they walked on.

The swing-doors were opened as they passed : warmth leaped out invitingly.

" 'Twouldn't do any harm just to look in," said Smith. " 'Tisn't as if we were goin' to drink. We ain't. We're pledged teetotallers."

So they went in and ordered lemonade. " Let's wet them pledges," said Smith, and they drank soberly, " Success to temperance." Then they discovered the lemonade lacked flavour, and the bar tender pushed a bottle of whisky very near. Like a man in a dream, Smith picked up the bottle and tilted it over his glass ; tilted it, too, over Jones's. " Say when," he observed, and his companion said " When." That began it —they drank the same toast in whisky ; they drank it again ; they drank it still again. It was not their fault : they were simply molecules in the vast organisation of Fate. Presently they met a few of the crew of a big German sailing ship, and because they were rulers of the earth at that time they told the " Dutelies " that the same city was not big enough to hold them all. Therefore they purposed clearing the aliens from the port finally, and they set to work. The Germans bleated and fled ; but two of them were down, and spurned aside. On swept the victorious twain, and before twenty could be counted the street was deserted. They ran amok full-bloodedly, and a wiry Colonial policeman attempted to arrest them. That policeman sat down suddenly in a basket of vegetable stuff outside a shop door, and the two sailors continued their merry perambulation. Presently they remem-

The Adventures of Two bered the hall, where all the trouble had commenced. They would go and show the

missioners what obedient children they had been, and they set off with that purpose ; but on the way they remembered something they had forgotten, and went back to the ship for it.

At the ship they found the night watchman, an old, worn-out man of sixty years of age—the sea ages men swiftly—and

because he was a decent man, with a sense of honour, they attempted to seduce him from his task. They seduced him *vi et armis*, and bore him almost shoulder-high up-town ; there they plied him with spirits of proved potency, until he was uncertain whether he was a night watchman or Christmas Day. After this they frogmarched him at a run

What Happened

down the principal street, yelling as if the end of the world

had come ; brought him to the door of

the hall, and swung him like a sack.

There were two swing-doors, and they

opened sweetly to the forceful impact of

the night watchman's body, discharged

from their hands like a stone from a cata-

pult ; the old man passed in, the door

swung to solemnly again, and all was peace.

" Here's another whisful teetotaller," said the bigger of the two, putting his head inside after a lapse of several startled minutes. " He'll sign the pledge if ye'd like him tu." Then they continued on their royal course, with their heads amongst the stars, walking on air, until a draft of Colonial police surrounded them, and the captain of their ship was called upon next day to pay a substantial fine or lose the services of two of his best men for a fortnight.

Of course, it was a very shocking holiday making, but I am firmly of the opinion that those two men went ashore with the best intentions, and that they signed the pledge with a fixed determination to keep it rigidly. But their childlike minds did not dissociate teetotalism and drunkenness, that was all, and they never grumbled at the amount of the fine when it was deducted from their wages. They had had their pleasure, and they were quite willing to foot the bill.

They returned to duty, and behaved for the rest of the voyage in an exemplary fashion. A year later I happened to be in a South American port, and ashore I met the mate of a sailing ship. When he found out my ship he smiled.

" I have a couple of your men on board



A battalion of Egyptian infantry was marching through the streets. The donkey cavalcade charged them like the Light Brigade at Balaclava.

the he murmured. At once I asked after their characters.

"At sea I wouldn't wish for better men," he said ; "but—well, the skipper wouldn't allow any liberty here, and wouldn't advance any money. So they lowered one of the lifeboats one night and took it ashore—it was blowing half a gale, but they didn't seem to mind. Then they sold the lifeboat for five dollars, and shut the policeman who tried to arrest them in a saloon. They wouldn't let him out either until he'd promised they should hear no more of the matter. Yes, we got the lifeboat back."

And since then I have heard no more of them ; but I am well aware that if they are still alive they are pursuing their old-time course, working like giants, and playing like irresponsible children when ashore.

But there are sailors and sailors. The average deep-waterman does not necessarily spend his pay and time in getting drunk ; indeed, I have known men who, on reaching a foreign port, at once settled down to an exhaustive study of it, and came away primed to the hilt with knowledge. They could have given a Cook's tourist points in sight-seeing ; and they saw intelligently, so that they could converse in an interesting way on the marvels they had beheld.

At times, too, they behave themselves in another fashion. Many will remember the story of the sailors who arrived at a certain port, which shall be nameless, and found in the cathedral there a pair of British flags, which had been captured from a British landing party in the begin-

The British Flag beginning of the century. I do not remember the particulars of the engagement in ques-

tion ; but there the flags were, proudly elevated on the fine old walls, an eyesore to any reasoning Briton. Our sailor friends saw and thought.

"This is no place for British bunting," they remarked the one to the other, and at once arranged a plan. That evening they stowed themselves away in unheard-

of corners of the great building, when the sacristan made his tour preparatory to locking up the sacred building. Then, darkness being upon the world, they began to act. The flags were very high up on the wall. They had no ladder, but when was the British sailor at a loss ? They formed a pyramid of humanity, three men forming the base, two men its second course, one man its third, and up this structure

For Britain's Honour

another venturesome fellow climbed. He stood upright on the topmost mariner's shoulders, and found he was still a couple of feet too low.

"Stand from under !" he whispered in a sepulchral voice, and jumped upwards, caught the butts of the flag-staffs in his two hands, and fell like a stone through space. The noise was indescribable. Voices were heard outside, but none dare venture into the edifice : it had the reputation of being haunted. The sailors gathered themselves together soundlessly rolled the flags up, after stripping them from their staffs, and concealed them under their coats. It was a fine effort, and it deserved to succeed, but, alas ! after shivering half the night in that gloomy building, they opened a window and made their escape to their own ship. But next morning the whole town was roused, and every ship was searched. The flags were discovered. There was a period of strained relations, but ultimately the prize was returned to its valiant owners, the sailors were fined handsomely, and the matter was forgotten.

It is a wonderful thing to see a troop of British sailors ashore at an Eastern port. I remember seeing such a sight not so very many years ago. It was a blazing hot day ; the temperature was indescribable. Each sailor donned his best clothing for the occasion—it was a Sunday—and came out apparelled like Solomon in his glory. It was probably because it was so hot that they wore suits of thick pilot cloth, all angles and lines,

suits that looked as if they had been hewn out of solid blocks of indigo with an axe. Real East India Dock Road styles they were, as thick as a plank and as hot as

a thick woollen muffler of a startling pattern about his neck. One had a pair of kid gloves, but he had had a job of blacking down the rigging a few



Some genius evolved the idea of calling upon the employer of the donkey boys and demanding redress.

the fires of Erebus. Each man, too, being a dandy in his way, wore a pair of tight, high-heeled shoes, with a fancy pattern worked on the instep. Each had a high-crowned bowler hat of a fashion forgotten ages ago, and each man had

days previously, and had not yet recovered.

They went ashore in state, and immediately on landing were held up by a yelling troop of donkey boys. The various flea-infested mounts were thrust forward

for their inspection, the black-faced boys proclaimed the merits of their beasts in choice broad Scotch, for this was in Alexandria, where the longshore Arabs speak purest Dorie! The biggest of the sailors looked at his companions. The streets were ablaze with a midsummer sun, dust was thick, the heat was terrific.

**A
Donkey
Trip**

Far away on the banks of the White Nile was a secluded inn-garden, where refreshments

suiting to the needs of thirsty sailor-men might be obtained—but it was a tedious journey on foot.

"We'll hire the whole boiling of 'em," said the spokesman, and in a trice they were mounted. The donkeys naturally jibbed: they had been trained to do it. But those men, who had been used to drive a stubborn ship through a heaven's-hard gale, wasted but little time with the refractory animals. They urged them forward, and they entreated the yelling cohorts of drivers to keep on urging. Finally, the whole troop stampeded like a mule train disorganised by Maxim fire. Once they were set a-going there was no holding them in. They charged like the Household Brigade at Kassassin, and woe-betide the unfortunate Arab, who got in their path! He was bowled over into the dust and swept aside like the skin of a sucked-dry orange, and the thunder of hoofs grew overwhelming. Through the packed bazaars they volleyed, veiled beauties shrinking into the tiny shops in alarm, policemen yelling indistinct threats, and the sailors cheering like the madmen they were. On they tore; stalls were capsized, stall-owners followed; the gutters were rich with spilt garden stuff. Ahead of the cavalcade rose the strains of martial music: an Egyptian battalion of infantry was marching in close order through a wider street. The donkey cavalcade was on them like the Light Brigade at Balaclava. It was in vain that white officers and brown officers alike urged their men to stand fast. Through the serried ranks

those donkeys tore, their riders yelling and swearing red-facedly. Full-rigged soldiers were bowled over like nine-pins; the white colonel was thrust, protesting, into a doorway, there to witness the utter rout of a battalion that was the pride of the Egyptian Army; and the disastrous avalanche still tore on. Now and then in a ship's fo'castle you may still hear of the charge of the sixteen against a thousand, and of the annihilation that resulted.

Exhaustion stopped the donkeys ultimately, but each rider had managed miraculously to preserve his seat, and each rider was quite ready to go through with the whole escapade again. But the donkeys jibbed: they refused to be coerced by the sailors' heels. Thereupon came their lawful owners, and started to persuade them in the simple fashion they have in Egypt. That is, they thrust sharp-pointed steel canes into the fleshy parts of their bodies, leaving bleeding wounds, and when the steeds refused to move on reception of such hints, they worked the evil points to and fro in the sores until the teeth of the white men stood on edge. One sailor hit a giant donkey boy full in the face with his clenched fist, and sent him to the ground. Instantly he was set upon by a mob that had sprung apparently from nowhere. He went down, fighting fiercely; his companions hurried up to his assistance; the *mélée* became terrible. And there was real danger in it, too, for the Arabs did not hesitate to use their pointed prods. One sailor had a stab in his chest that almost let out his

**A
Mad
Stampede**

life, but there were sixteen men, and each had a pair of fists. They sailed in as valiantly as they had charged the Fellaheen battalion; they snatched up human bodies for weapons; they were *muslih* in that mad moment, and they won the day. But they would not rest content with that. They singled out the drivers of the respective donkeys and lashed them fast upon their own

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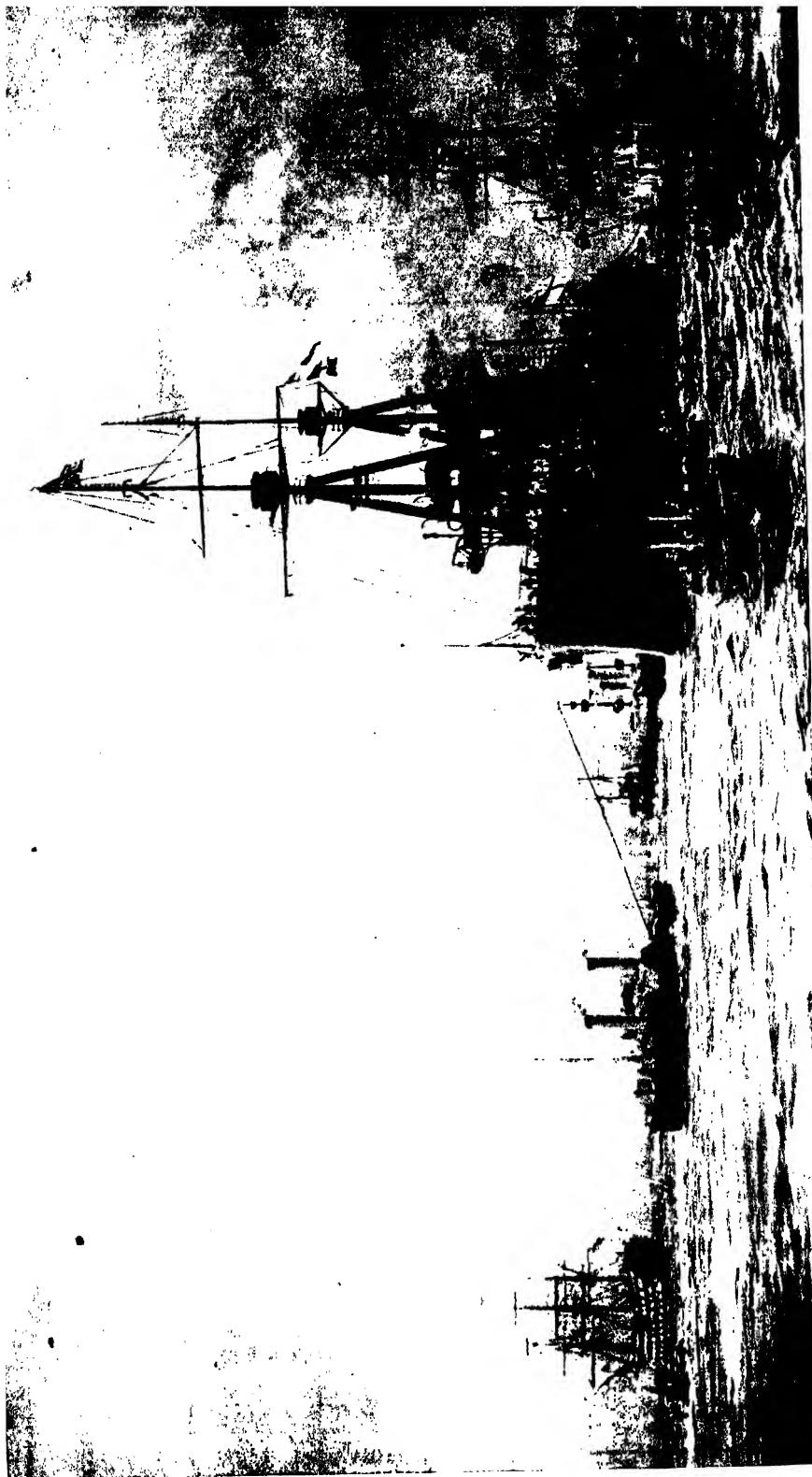
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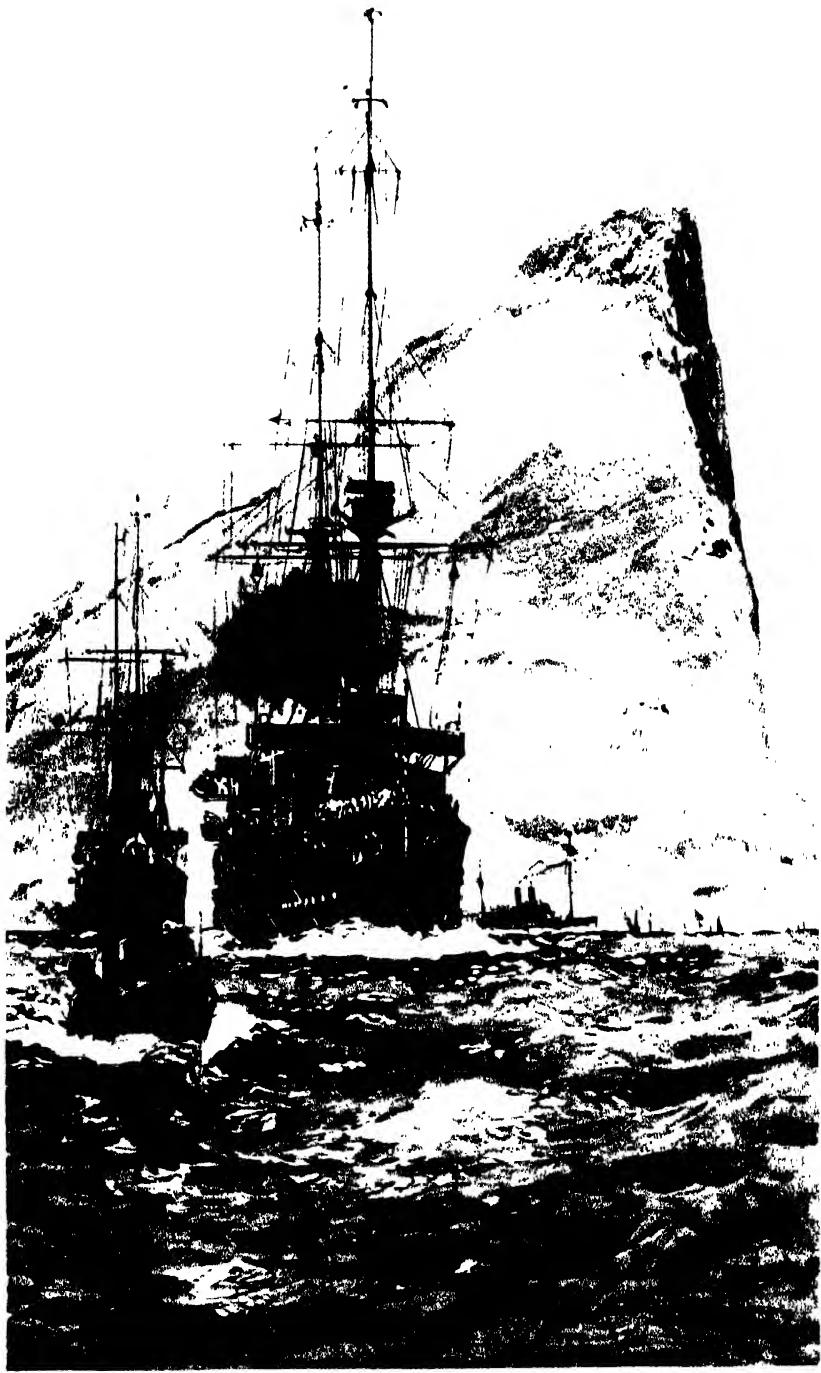
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THE ROCK OF GIBRALTAR

cumbersome saddles ; they turned the donkeys' heads towards home, and started them off with a whoop and a yell ; and then, quite happy, somewhat hot, and very thirsty, but well satisfied with their day, they continued on foot to the secluded garden by the banks of the White Nile, and there fought their battles over again

The End of the Day to the accompaniment of popping corks. When they reached Alexandria some genius

evolved the idea of calling upon the actual employer of the donkey boys—an old sinner who thought nothing of fleecing any sailor who came near him. But before they entered his den they made a few preparations. The smart muslers were removed from the necks they protected, and were formed into improvised slings. They rubbed their faces in the dust, and generally made a desert of themselves, until they looked as fine a crew of scarecrows as ever spoke the English tongue. In this guise they presented themselves to old Moses, and told him a harrowing tale of how they had been assaulted by his hirelings and beaten to the ground. Moses waved them away imperiously.

"It's none of my business," he said. "Begone!" But they were prepared for this. In a second two of the most sober had vaulted over the bar and were amongst the bottles there, two more had seized Moses, and two more his assistants.

"Ye'll pay the damages or we'll pull the place down about your ears," he was told, and a thunderous crash told him the work of destruction had begun. He held out until half his shop was a ruin ; then he caved in, and paid a fair sum to each man by way of sop to his wounded dignity. When the sailors counted up the results of their day they found they were several piastres to the good, in addition to a skinful of liquor and all the excitement of Donnybrook Fair and a General Election thrown in as make-weight !

They live in hopes of being sent to Alexandria again

There is a still seamier side of Jack's life ashore which may be touched on, but briefly. It is a side that is rapidly being obliterated, but it still exists. To see it in full swing you must go to some of those Far Eastern ports, away at the Back of Beyond. Here every man who is to be seen along the water-front is, to all intents and purposes, a vulture on the outlook for prey—that prey the unsophisticated merchant sailor. It is, *par excellence*, the merchantman who falls into their clutches ; the naval sailor is under strict discipline, and usually hunts in large parties. These men keep gambling dens, drink shops, so-called curio establishments : anything to tempt the man who has been for months and more away from the land. And they wait until they hear of a man who has been paid off—perhaps an entire ship's crew might have been discharged, the three years' agreement having expired. Think of the spoil to be made ! Twenty men, each with fifty to a hundred pounds in his pockets, and wishful to get rid of that money as quickly as he can. No wonder he hails these suave vampires as good comrades, and eagerly accepts their offer to show him the sights, with suggestive winks and nods, as if some of those sights were not of the most seemly, and only those who had capable pilotage might be allowed to enter sundry sacred courts.

Jack accepts, the elements of mystery adding fuel to the fire of his natural desire for pleasure. Proceedings open with a drink, an adjournment to another place, where deliciously seductive pleasures are hinted of darkly.

" You'll see something that will open your eyes, old chap," says the boon companion. " Have a drink, and then—ah !" And Jack has a drink, and he probably has no more. There are no dazzling beauties to caress him and flatter him, but there is a dark back room where a drugged sailor can be robbed of every penny he possesses, where, if he make any indecent

Crimps and Land-sharks



Every man who is to be seen along the water-front of an Eastern port is to all intents and purposes a vulture on the look out for prey.

outery, he can be knocked on the head, stripped of his clothes, and thrown down a trap-door into a rapidly flowing river, where assuredly the fish will tell no tales. Or, if he prove docile to rob and drug - well and good ; he need not be murdered at all. A living sailor is worth money. He is kept under drugs until some none-too-exacting shipmaster asks for a crew, and the poor robbed fool is shipped aboard an outward-bounder, helpless, half-dead, and his evil genie pocket one, two, or three months' advance pay for the services that will be rendered by their victim on a homeward journey.

He has only himself to blame, you will say. Of course ; but aren't those who turn a man who is, except in the small matter of his courage and his powers of endurance, a child at heart, adrift in a

place that is infested with robbers, and turn him adrift, too, with a modest fortune in his pockets, somewhat to blame? Send a child along a lonely road with a handful of sovereigns, let that child be found next morning stunned and robbed who would blame the child ? Who would blame the assailant ? He has only taken the gifts the gods sent. But what of the one responsible for that journey ? And Merchant Jack ashore is but little better than a child. He is not trusted to handle money regularly, and he is then given a large sum all at once. He has had no teaching to guard him against

specious pseudo friends who are really enemies in disguise ; he is an outcast, and anyone who will speak a kindly word to him is a friend. So he puts his trust in thieves and murderers, and he repents his trust in sackcloth and ashes, and the world calls him a fool and something worse - perhaps, because in its own well-sheltered, well-policed existence, it has never been brought into immediate or even distant contact with that legion of fatteners on the dead who haunt Jack's every step ashore.

To see the merchant sailor in all his glory you should view him at some one of the continental ports. See him paid off after a voyage. If he is cool and daring afloat, Jack is an irresponsible infant of tender years ashore.

FRANK H. SHAW.

The Romance of Lighthouse Building

JUST as the beams from the lantern of a lighthouse catch and hold the eye, so does the romance of their ever vigilant guarding of the ocean highway catch and hold the mind. To a landsman there is hardly to be found a more interesting subject, and one about which there is, for the average person, so little available information.

Doubtless lights to guide the navigator at night are as old as the use of ships for seafaring, but the first lighthouse proper of which we have any authentic record was that built about B.C. 331 upon the island of Pharos to guide sailors into the port of Alexandria. It is said to have continued its benign work for sixteen hundred years, and its name is in use to-day among most Latin nations as a generic title for all sea lights. In England there are still to be seen the ruins of several Roman light-towers, the most notable being that on St. Catherine's Down and one in Dover Castle.

In its simplest form a lighthouse was a tower, on the summit of which wood or some other fuel was burned in a brazier. So primitive an arrangement must have had its defects patent to all its users, but lighthouses of this type existed in various corners of the world until well into the last century.

Though light-towers upon cliffs and islands had been known and used so long, it was not until close upon the dawn of the eighteenth century that it occurred to any man that it might be possible to build a beacon right on a partially sunken reef. In 1659 a man came forward with

a proposal to rob of its terrors the infamous Eddystone reef that lay right in the fairway to the important port of Plymouth. Mr. Henry Winstanley, for that was his name, was looked upon, not without cause, as a madman; but so great was the toll of ships and lives taken by this saw-edged reef that any proposal was listened

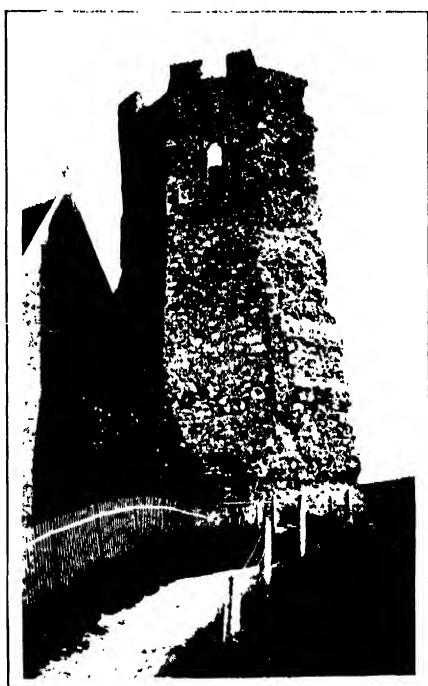


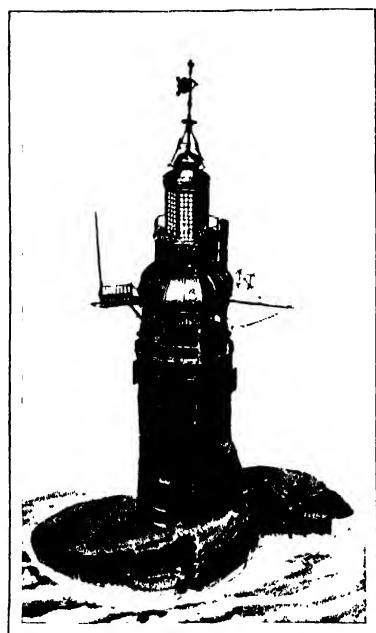
Photo: Chester Vaughan, Acton, H.
**The old Roman light-tower or Pharos
on St. Catherine's Down.**

to, and Winstanley got permission to proceed.

Though work was started almost at once it was not until November in 1698 that its light was first exhibited—a light that shone from a building so fantastic that to modern eyes it seems but the dis-

ordered product of a dream. However, it did its work until November, 1703, when it was overthrown in one of the hardest gales that have ever been chronicled, taking with it its architect and inventor. A few weeks later the tragedy was completed by the total loss upon the reef of a richly laden vessel, which, being homeward bound, knew nothing of the eclipse of the light, and, seeking its helpful rays, was cast away. The warning was not neglected, and in three years' time a new lighthouse was begun.

A certain Captain Lovet, having leased the rock from the Brethren of the Trinity House, engaged as his architect one John Rudyerd, a London mercer who kept a shop on Ludgate Hill. The choice seems



An exact model of Winstanley's Lighthouse on the Eddystone Rock.

a curious one, but whatever the reasons that led to it, they were justified. Rudyerd's design was simple, but masterly. He chose a cone for the outline of his tower, judging that such a form would offer the least resistance to the force of

the waves. The substructure, 63 feet in height, was of timber combined with courses of Cornish granite; first two courses of timber, then five courses of granite, then two more of timber, and so on, the whole being secured with iron



A model of Rudyerd's Eddystone Lighthouse in the Trinity House Museum.

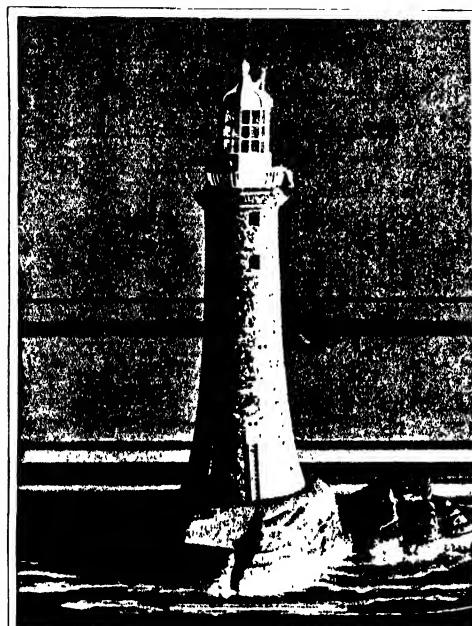
cramps. Outside these courses strong upright timbers were fixed, and carried up as the work proceeded; and within these outside timbers, scarf'd—that is, the ends overlapping and firmly fastened together—Rudyerd placed his superstructure, four storeys of timber capped by an octagonal lantern. The total height was 92 feet, and the whole building was an admirable piece of ship-carpentry, the granite being merely introduced, as it were, by way of ballast. Rudyerd finished his work in 1709, and for nearly fifty years it stood to warn vessels off the Eddystone.

At first the light was attended by only two men, but one day one of the pair died, and the survivor, fearing that he might be accused of foul play, actually managed to keep the body until the boat

from the shore relieved him, nearly losing his reason in the meantime. From that time forward the third man was employed, and this allowed each to take a holiday

recent storm had loosened one or two bricks in the kitchen fireplace.

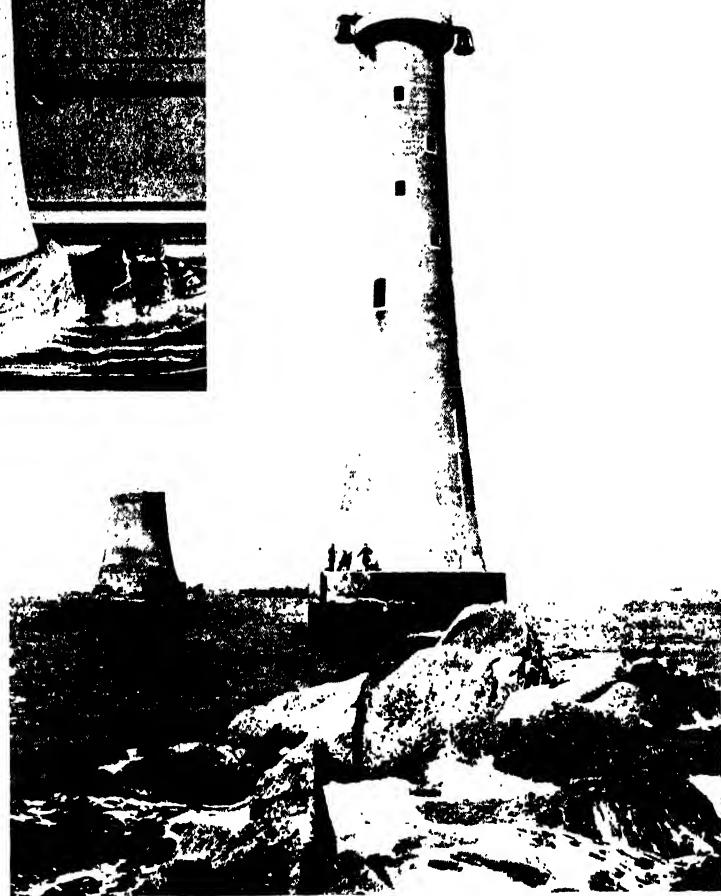
At about two o'clock in the morning of the 2nd, the light-keeper on duty entered the lantern as usual to snuff the candles, and found the whole place in a smoke. To let the smoke out he flung open the door leading to the bal-



The third Eddy-stone Lighthouse. This was built by Smeaton.

occasionally and spend a month ashore among his friends. One very curious effect of their way of life was that, instead of developing a sense of comradeship, they fell into the gloomiest taciturnity, and often would hardly speak a word to each other for a month on end.

On the morning of December 1st, 1755, the boat from Plymouth visited the rock and landed stores as usual. The light-keepers reported all well, except that a



The Eddystone Lighthouse as it stands to-day.

cony, and immediately the whole cupola burst into a blaze. He shouted at once to his comrades; but they had no appliances beyond a few leathern

buckets, and, to get water, they had to descend 70 feet and reascend the steep stairs before tossing what was left unspilt upon the flames. To make matters worse, the molten lead began to pour down upon them from the roof, and they fled from room to room, the fire following them down towards the sea. The glare

**The Fire on
the
Eddystone** upon the Eddystone had already been per-
ceived at Cawsand and Rame Head, and

fishing-boats pushed off at once for the rock, though a fresh easterly breeze was blowing. By the time they reached it the light-keepers had not only been driven from all the rooms, but, to escape the molten lead and red hot bolts and falling timbers, had taken shelter under a ledge of the rock on its eastern side, whence they were rescued, more dead than alive, with greatest difficulty. One of them, Hall by name, was terribly scalded about the head and shoulders, and insisted (though nobody believed him) that a quantity of lead had fallen into his mouth, passed down his throat, and settled in his stomach. He was sent to his home at Stonehouse, where the doctors who visited him declared his story to be impossible, and began to think that sheer fright had made him a monomaniac. Hall, however, grew rapidly worse, and died within a fortnight in terrible agonies. A post-mortem examination proved that he had spoken the truth after all, for in the stomach was found a flat oval-shaped piece of lead 7 ounces and 5 drachms in weight.

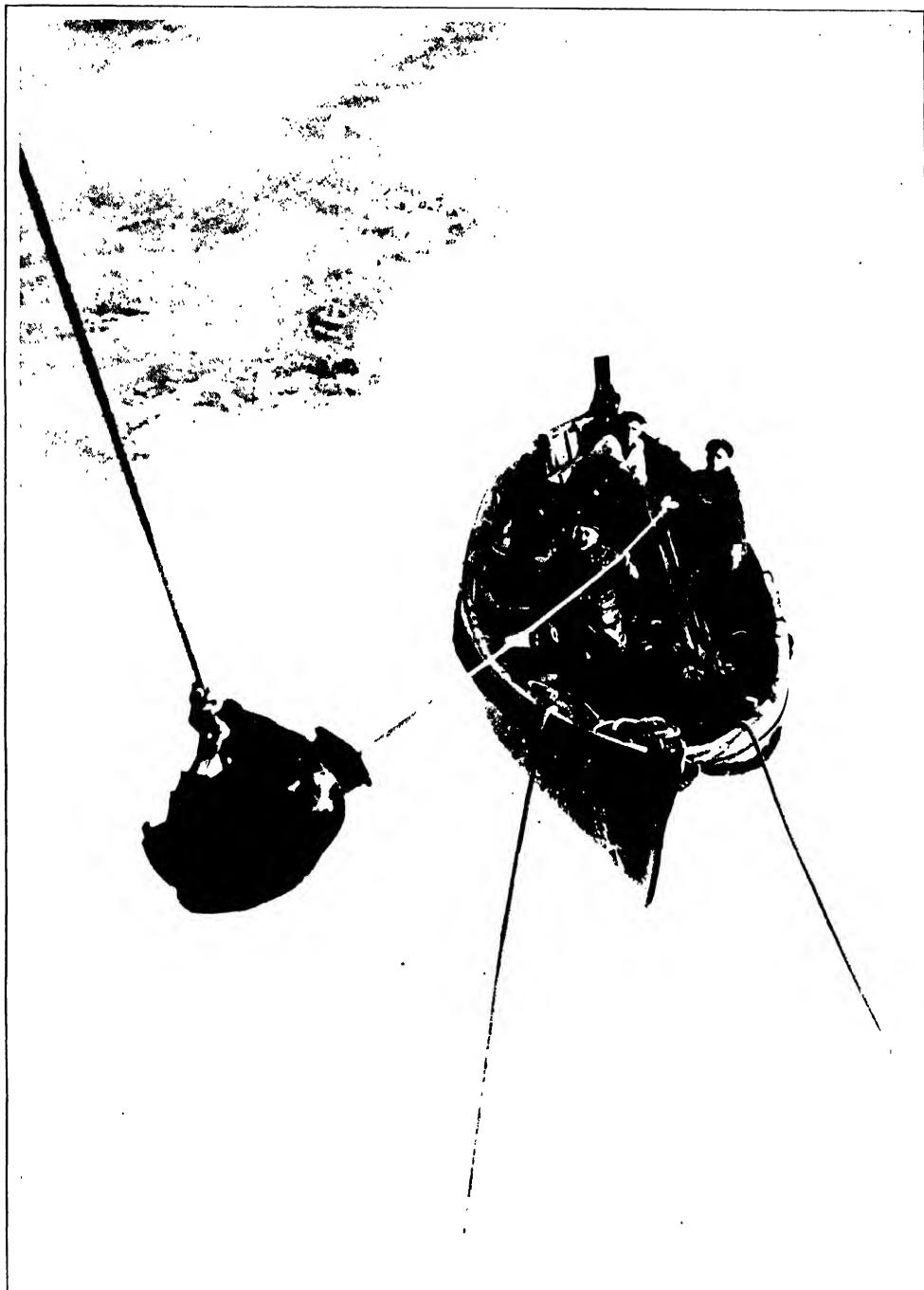
Thus perished a second Eddystone lighthouse; but a very few months passed before a third was rising in its place. Captain Lovet, the former lessee of the lighthouse, was dead, and his interest had been acquired by a Mr. Robert Weston and two others. Weston at once cast about for a new architect, and his choice fell on John Smeaton, a young Yorkshireman, an inventor of mathematical instruments and a promising engineer. The Trinity House has been fortunate in its servants, and a streak of genius has lain

in all our great lighthouse builders—Winstanley, Rennie, and the two Stevensons; but it never had a happier inspiration than when it chose Smeaton. At the Leeds Grammar School this queer Yorkshire boy had been known as "Fooly Smeaton." He cared nothing for the games of the other boys, but would spend hour after hour in watching a group of masons or carpenters at work, and asking them questions. His lifelong friend, Mr. Holmes, tells many stories of his boyish inventions. At one time it was a windmill fixed on the top of his father's barn; at another, a pumping-engine, which he set to work on his father's fish-ponds, killing all the fish and exasperating his parent considerably. Smeaton senior had destined him for the law, but at last gave way, and allowed him to go up to London, where, at the age of twenty-six, we find him reading papers before the Royal Society, and already credited with an invention for marking the "way" on a ship at sea, several improvements in the air-pump, in ships' tackle, and in water and windmills, and an attempted improvement in the mariner's compass. At the age of thirty-two came the grand opportunity of his life, the offer to rebuild the Eddystone. Weston's letter concluded with the words, "Thou art the man to do it."

"Nothing but wood can possibly stand on the Eddystone," said the Brethren of the Trinity House. "Not so," answered Smeaton; "the former buildings have lacked weight." Smeaton had his way. He posted down to Plymouth in March, 1756, and so

**Smeaton's
Great
Chance**

bad were the roads that the journey from London took him six days. At Plymouth he called on Josias Jessop, a foreman of shipwrights in the dockyard, to whom he had been referred for information about the previous lighthouse. Smeaton was burning to go out and see the rocks at once; but the sea was so heavy that no opportunity occurred until April 2nd, when he was able



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An amazing photograph taken from the Eddystone Lighthouse showing the relief man ascending to the tower in heavy weather.

to reach them. The sea was breaking with such violence that there was no possibility of landing; all he could do was to view the cone of bare rock. Three days later he managed to set foot on the reef, and stayed there more than two hours, when the sea again drove them off. Several succeeding trips were made to no purpose, but on the 22nd Smeaton



Photo: Charles Hyde.
A lighthouse man on duty during the day.

managed to effect his second landing at low water. The party stayed until driven off by the rising water, when they retreated to their sloop, which lay off till the tide had fallen, when Smeaton again landed, and the night being perfectly still, he says, "I went on with my business until nine in the evening, having worked an hour by candle light." Next day he landed again, and was only driven off by a ground swell and a rising wind that forced the sloop to put back in haste for Plymouth.

Having surveyed the rock, Smeaton posted back to town, made his report, and was authorised to proceed with his design. He borrowed Rudyerd's conception of a conical building, but proposed to enlarge the diameter considerably. The type which he kept before him was that of an oak tree, which the storm neither bends nor breaks. He also devised a system of dovetailing then scarcely known in masonry, though common enough in carpentry; and, whereas his predecessors had lost much time in the journeys from Plymouth and back, he proposed to moor a vessel within a quarter of a mile from the rock, large enough to accommodate his workmen, who might use every favourable moment.

Smeaton fixed his centre and laid down his lines on the afternoon of August 3rd, 1756, less than a year after the fire. The rest of the summer was spent in bringing his materials to the rock, shaping them, and cutting out the dovetail recesses for the foundation stones. The work was finished at the close of November, and the *Neptune*, his store ship, weighed anchor for Plymouth.

Next summer the building began. The first stone, in weight two tons and a quarter, was laid on June 12th, and by the evening of the following day the first course of four stones was finished. The reason of this small number of stones was, of course, the slope of the rock, which of itself afforded the greater part of the foundation. The second course, of thirteen blocks, was laid by the 30th; the third, of twenty-five blocks, by July 11th; the fourth, of thirty-three blocks, by the 31st. By August 11th the sixth course, bringing the structure above high-water mark, was completed. That evening, as the men were just about to lay the centre stone of the seventh course, and Smeaton was strolling to and fro on the level platform his ingenuity had raised above the waves, he made a false step, and fell from the brink of the masonry down among the rocks on the west side. The tide being low, he soon scrambled up again. He had



The Beachy Head Light, one of the most modern of our light-towers.

dislocated his thumb, however ; but this, as no surgeon was near, he reset himself, with a violent pull, and then quietly returned to his work of fixing the centre stone of the building. The year's work ended with the laying of the ninth course, on September 30th.

The following winter was a stormy one. It was May 12th, 1758, before Smeaton and his workmen returned to the rock, and, to their delight, found the work had

suffered nothing from the gales. The cement (brought in cedar casks from Watchet) had become as hard as the stone itself, and the foundations seemed as strong as the rock on which they stood. The work now went on apace, and the twenty-ninth course was laid before the end of the season. Day after day, while he lived at Plymouth, Smeaton used to come out upon the Hoe with his telescope, and, from the place where the Armada was first sighted, peer out towards the Eddystone. " There were still many who persisted in asserting that no building erected of stone could possibly stand on the Eddystone ; and again and again the engineer, in the dim grey of the morning, would come out and peer through his telescope at his deep-sea lamp-post. Sometimes he had to wait long until he could see a tall, white pillar of spray shoot up into the air. Thank God ! it was safe. Then,



The kitchen in the new Beachy Head Lighthouse.

Photo: Louis Ernster.

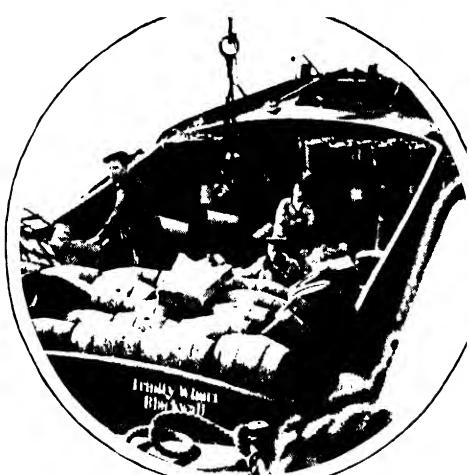
as the light grew, he could discern his building, temporary house and all, still standing firm amidst the waters ; and, thus far satisfied, he could proceed to

his workshops, his mind relieved for the day."

Preparations for setting up a temporary light were almost completed when, on October 10th, a quarrel between the Trinity Board and the lessee of the rock interrupted the work. The quarrel was not patched up until well into the following year; but on July 5th the work was started again. On August 17th the forty-sixth, and last, course was laid, bringing the column to its specified height of 70 feet. The last mason's work done was the cutting out of the two words, "*Laus Deo*" ("Praise be to God") upon the last stone set over the door of the lantern. Round the upper store room had already been cut the text, "Except the Lord build the house they labour in vain that build it." Soon after the iron balcony and the lantern were put in place, and, over all, the gilt ball, the screws of which Smeaton fixed with his own hand, perched on a little platform above the cupola, some

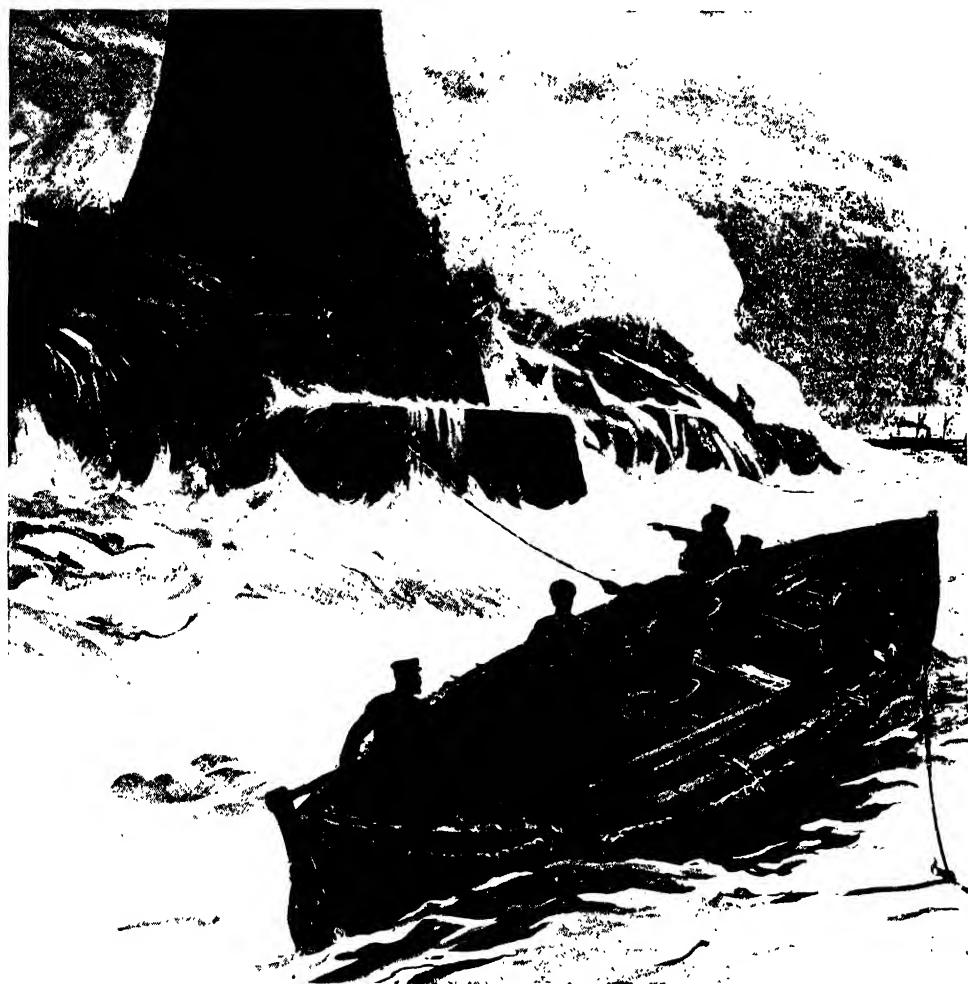
For more than a century and a quarter it shone from Smeaton's tower; but about the year 1870 reports began to reach the Trinity House that certain suspicious tremors had been noticed by the light-keepers. Steps were taken to strengthen the building, but the tremors increased notwithstanding; and in 1877 the Elder Brethren of the Trinity House, with their engineer, Mr. James N. Douglass, made an inspection of the tower and rock. This inspection proved that the mischief lay, not with Smeaton's building (which was strong enough to stand for another hundred years), but in the rock itself, which the waves were slowly undermining. The Brethren at once set to work. Many surveys were made, and a base for a new lighthouse discovered on a rock some forty yards S.S.E. of the old tower. Its one drawback was that its summit stood only just above the level of low water, and the foundations, therefore, must be laid below that level. Mr. Douglass, however, could overcome that difficulty. The first landing on the rock was made on July 17th, 1878. The work began on the 23rd of that month, and the top stone was laid on the first day of June, 1882.

The main idea is that of Smeaton's structure, but there are many improvements. The new tower contains 4,668 tons of masonry. Smeaton's contained 998 tons only. The stones are 2,171 in number, containing 63,020 cubic feet; and, to make all secure, each stone is dovetailed above, below, and on all sides with the stones adjoining, besides being cemented. Smeaton's tower had four rooms besides the lantern. Douglass's has nine, each larger than any in the old building, and the light is thrown almost five miles further than before. The stump is all that now remains of Smeaton's tower, the upper part having been carefully taken to pieces and re-erected on Plymouth Hoe. Smeaton had spoken of a "possible perpetuity" for his work; but the true perpetuity lies in the type which he handed on to Rennie, Stevenson, and now to Douglass, all of whom, like the torch-



A Trinity House lighter laden with stores and water barrels for lighthouses.

hundred and twenty feet above the sea, while his assistant, Roger Cornthwaite, stood on the opposite edge, to balance his weight while he worked. On October 16th the merciful light shone out from the Eddystone.



Landing stores for a lighthouse in an isolated position is often risky work during heavy weather.

bearers in the old Greek game, have taken the light from his hands, and run with it.

It was in a tender named the *Smecalon* that Rennie and Robert Stevenson plied between Arbroath and the Inchcape. Everyone knows Southey's ballad of "The Inchcape Rock" and the tradition of the bell placed upon it early in the fourteenth century by the Abbot of Arbroath, or Arberbrothok, to ring out its warning to mariners, and how a notorious pirate cut away the bell.

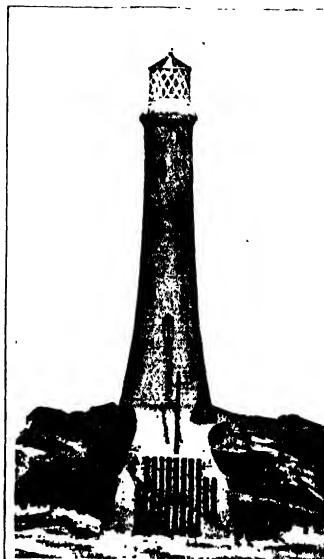
Though the Inchape lies but eleven miles east of the Scottish mainland, near

the entrances of the Firths of Forth and Tay, and extends its dangerous back for almost two miles, no steps were taken to replace the bell or erect a beacon until the beginning of this century, when the Board of Commissioners ordered John Rennie to examine the site. In his report he recommended a stone lighthouse on the lines of the Eddystone. Powers were obtained from Parliament in 1806, and Rennie was appointed engineer, with Robert Stevenson as his assistant.

The year 1807 was spent in building

vessels for the conveyance of the stones, and in erecting machinery and building shops at Arbroath, the most convenient point on the coast for carrying on the land operations. A smith's forge and a temporary beacon were put up on the rock itself, while a floating light, in an old fishing-boat, was anchored off the reef, until the lighthouse could be finished. During the short period — shorter than in the case of the Eddystone in which the rocks were uncovered, some progress was made in digging out the foundations. How dangerous this work was may be gathered from the following account which befell the workmen on September 2nd. The *Smeaton* had brought out a large number of masons from Arbroath that morning, and, having landed them safely on the rock, was riding off at a little distance. The wind was rising, and the men began to fear for the *Smeaton*'s cables. A party put off in a boat to see that all was secure; but before they could reach her she was adrift, leaving thirty-two men upon the reef in the face of a rising tide.

Before the *Smeaton*'s crew could set her mainsail, and tack in towards their companions, she had drifted, with both wind and tide, about three miles to leeward, and it was clear that the rock must be covered long before she could reach it. The men on the rock had but two boats that, in fine weather, might at a pinch carry twenty-four persons. Mr. Stevenson at once saw the gravity, and, as he thought, the hopelessness, of the situation. With great courage he kept his fears to himself, and allowed the men to go on with their work.



The famous Wolf Rock Light-house between Scilly and the Lizard.

When they had been working for three hours or so, the water began to cover the lower parts of the foundation, and the men were forced to desist. The forge fire was put out, the smith ceased his hammering, and the masons their hewing and boring. When they picked up their tools and looked around, the vessel had drifted almost out of sight, and one of their three boats had gone in pursuit of it. No one spoke, but every man felt he was lost. They looked towards Stevenson, but he had borne up a long while against the horrors of the position, and now was speechless. He tried to speak, but his tongue was parched in his mouth. He turned to one of the pools on the rock, knelt down, and lapped a little of the salt water. But, as he lifted his head, to his incredulous joy somebody called out, "A boat!" and, sure enough, there was a large boat making for

them through the heavy sea. She proved to be the Bell Rock pilot boat, which had come off from Arbroath with letters. Her timely arrival saved the workmen. They were all taken off and landed in safety, though completely drenched and exhausted.

Rennie visited the rock on October 5th. He came off from Arbroath, and spent the night on board the lighthouse yacht, where he and Stevenson had much to tell each other. Next morning there was a great display of bunting on the rock when Rennie landed and inspected the progress made, and the next day the whole party returned to shore for the winter.

The first stone of the tower was laid on July 10th next, and by the end of

November three courses in masonry were finished. In 1809 the tower had risen to the height of 30 feet; by the end of 1810 the Bell Rock lighthouse was completed, and its light shone regularly after February 1st, 1811. The curve of the tower at its base is much greater than that of the Eddystone, and it is generally allowed that no lighthouse has more graceful lines. From its base to the top of the lantern it measures 127 feet.

It was Alan Stevenson, son of Robert, who erected, in 1838, the still more famous Skerryvore lighthouse, on the rocks of that name, twelve miles W.S.W. of the Isle of Tyree, in Argyllshire. The actual construction has no very salient points of difference from the works of Smeaton or Rennie; but instead of accommodating his workmen in a floating vessel, Stevenson built a barrack on the rock itself—a wooden tower, hoisted on three legs, under which the sea roared freely during the winter; and here, perched 40 feet above the wave-beaten rock, the architect spent many weary days and nights, with nothing in sight but the breakers, and nothing to be heard but howling winds and lashing seas. On one occasion a tender could not come off with provisions for seven weeks. The workmen passed a dreary time. They had little to eat, they had no tobacco, they were short of fuel, and their sodden clothing was worn to rags. Their slumbers, too, were at times fearfully interrupted by the sudden pouring of the sea over the roof, the rocking of the house on its pillars, and the spurting of water through the seams of the doors and windows. Twice the shocks were so violent that every man sprang out of bed, and some even escaped out of the barrack on to the bare wall of the unfinished light-

house, where they spent the remainder of the night in the darkness and the cold.

The type we have been dealing with—the solid stone tower, conical, or at least, rounded in shape has remained the type for all lighthouses exposed to the full fury of the sea. After this type, for instance, was built the Bishop Rock lighthouse, in the Scilly Isles, probably the most exposed lighthouse in the whole world, standing on an isolated rock, with 3,000 miles of stormy ocean between it and the American coast. On January 30th, 1860, a wave dashed up the tower to the height of 100 feet, and tore away the bell, weighing three hundredweight. Before the present stone tower was built, a fabric of iron piles was begun here, and carried up to the lantern, when, during one stormy night in January, 1850, the whole thing disappeared. A much more absurd erection was once placed where its neighbour, the Wolf Rock lighthouse, now stands. This was the huge figure of a wolf in copper, whose open mouth, as the wind poured into it, would bellow, and alarm the mariner. This Chinese phantasy went down before the first southwester, and is now replaced by a magnificent light, visible, on any but hazy nights, for twenty-five miles. The Needles light may be seen for twenty-seven miles, and those on Lundy Island and Barra Head for thirty-one and thirty-two miles; but these last lights stand 540 and 680 feet respectively above high water. The distances, of course, will vary with the power of the light and the height of the lighthouse. It is now usual to build a lighthouse as near the surface of the sea as possible, as very high lights are not visible in misty weather. The wonders of the lanterns themselves will be found dealt with in a later article.

Travellers' Tales

IN the fifth century before the birth of Christ the rulers of the great city of Carthage, finding themselves inconvenienced by her rapidly increasing population, formed a scheme by which they proposed at once to relieve themselves and to extend their empire by colonisation. They dispatched, under their admiral Hanno, sixty ships of war

the shores of the ocean beyond the Pillars of Hercules (Straits of Gibraltar).

The record of this voyage is the one relic of Carthaginian literature which has come down to us entire, though we have it only in a Greek translation. It seems that the original was posted up by Hanno himself in the temple of Baal, as a thank-offering for his safe return. Here it was seen by some inquisitive Greek traveller, who anticipated Captain Cuttle's advice and made a note of it.



We caught three of them, but they attacked us tooth and nail.

of fifty oars each, and with a total of not less than 30,000 half-caste emigrants, for the purpose of founding colonies on

turning back, pressed southward on a voyage of discovery. He had already taken interpreters on board. He passed the

mouth of the great Senegal River, which abounded then, as now, with crocodiles and hippopotami. The savages near its banks (he noted) were no longer the brown men of the Barbary States or of the Sahara, but the ebony negroes of the Soudan. They wore the skins of wild beasts, and spoke a language which even

the interpreters could not interpret. "They drove us away," complains Hanno, "by

"Farthest South" throwing stones at us." Continuing southward, they passed forests of sweet-smelling trees; they saw (as voyagers may see to-day) the natives burning down the withered grass on the hill-sides; and they heard by night the sound of pipes and cymbals, drums and confused shouts, the favourite amusements then, as ever, of the negro race. Still further south and west they went, until one night they reached a country which seemed to be on fire, and in the midst of it were flames so far higher than the rest that they seemed to touch the stars. When day broke, they found it was a large mountain, which they named "The Chariot of the Gods." Now there is one volcano, and one only, on the West African coast, and this is the Cameroons Mountain itself, just 4° N. of the equator. Already the voyage becomes tremendous. Still they went on, and reached a gulf called The Southern Horn, which contained an island with a lagoon. It was inhabited by savage creatures, the greater part of them women, covered with hair. "Though we pursued the men," says the log-book, "we could not catch any of them. They all fled from us, leaping over the precipices and defending themselves with stones. We caught three of the women, but they attacked us with tooth and nail, and could not be persuaded to return with us. Accordingly, we killed and flayed them, and took their skins with us to Carthage." These strange creatures were called by the interpreters "Gorillas"—a name not destined to be heard again till its strange revival two thousand years later, when

the mysterious, half-human ape of Equatorial Africa, then discovered or rediscovered, took its name, not unnaturally, from its equally mysterious prototype in the *Periplus of Hanno*. At this point the admiral turned his face for home; for, as the record simply ends, "here our provisions failed us."

Hanno was not by any means the only bold Carthaginian navigator. Pliny tells us of another admiral, Himileo, who in this same fifth century before Christ set out to explore the western coasts of Europe. His record has come down to us through a metrical Latin paraphrase, the "*Ora Maritima*" of Festus Avienus. After voyaging for four months, keeping always on his left the great shoreless ocean on which no ship had ever ventured, where no breeze blows, but eternal fogs rest upon its barren waters, Himileo reached the *Aestrymnides* (Scilly Isles). "Rich are these in metals, tin, and lead; spirited and industrious are the race which inhabit them; fond are they, too, of trade, and they traverse the boisterous sea, not in ships of pine or oak, but in coracles made of skins, sewn together. At the distance of two days' sail from these is the Holy Island, with its abundant emerald pastures, inhabited by the Hibernians; hard by lies also the wide Isle of Albion."

Herodotus, indeed, tells a story which, if true, would seem to show that Africa was circumnavigated many centuries before Vaseo Da Gama doubled the Cape of Good Hope. He says, very correctly, that Africa (or, as he calls it, Libya) shows itself to be surrounded by water, except so much of it as borders upon Asia.

And he goes on "Neco, King of Egypt, was the first whom we know of that proved this. When he ceased digging the canal leading from the Nile to the Arabian Gulf, he sent certain Phoenicians in ships, with orders to sail back through the Pillars of Hercules into the Northern Sea (the Mediterranean), and so to return

Round Africa

to Egypt. The Phoenicians accordingly, setting out from the Red Sea, navigated southward. When autumn came they went ashore, and sowed the land by whatever part of Libya they happened to be sailing, and waited for harvest ; then, having reaped the corn, they put to sea again. Thus two years passed ; and in

**An
Astonishing
Voyage**

the third year, having doubled the Pillars of Hercules, they arrived back in Egypt,

and related what to me does not seem credible, but may to others, that, as they sailed round Libya, they had the sun on their right hand."

We have now to consider one of the most astonishing facts in the whole history of mankind. Five centuries before the birth of Christ explorers had reached far down the west coast of Africa, if they had not actually sailed round that continent. The limits of their discoveries westward were the Canaries. *For no less than fifteen hundred years scarcely another step was taken.* This was principally owing to the map of the romantic Ptolemy of Alexandria and the Arab geographers upon whom his mantle fell. They unhesitatingly declared that the Atlantic, the "green sea of darkness," ended in impenetrable fog, and navigators were content to believe them.

The first steps towards acquiring any real knowledge of the world to the eastward were taken by the early Christian pilgrims, but the bulk of the information they gained were "travellers' tales" indeed.

There was one Antoninus of Placentia, for instance, otherwise known as Antoninus the Martyr. He visited the Dead Sea, and reports that nothing can live or even float upon it, "but is instantly swallowed up." The fact, of course, being that the Dead Sea is, of all seas in the world, the most difficult to sink in. He visited Jordan, and tells how that river opens a path for pilgrims, "and stands up in a heap every year at the Epiphany during the baptism of catechumens." A

malicious report had got about that the salt pillar of Lot's wife had been "lessened by licking." "It is no such thing," said Antoninus ; "the statue was just the same as it has always been."

A contemporary of Antoninus was the famous Cosmas Indicopleustes, who wrote a "Christian System of the Whole World, evolved out of the Holy Scriptures." His theory of map-making, when you come to look at it, is simplicity itself. He took a text or two, such as, "If our earthly house of this tabernacle be dissolved," "We that are in this tabernacle do groan, being burdened," "See thou make all things according to the pattern shown thee on the mount." What could be simpler than the conclusion that the tabernacle of Moses was an exact copy of the universe ? If further proof be needed, it is found in the text of the Prophet Isaiah, "That stretcheth out the heavens as a curtain, and spreadeth them out as a tent to dwell in." So Cosmas made the universe a flat floor exactly twice as long as it is broad, with our world in the centre surrounded by ocean, and, beyond, by an outer ring of land where bad people lived before the Flood. Noah brought his ark over sea from this to our present earth. As for the sky, it consisted of four walls meeting above in a dome of Heaven, and glued below to the edges of the floor !

While we are on the subject, we may mention a few more Christian pilgrims, in their order.

There was Arculf, a Gallican Bishop, who visited the Holy Land at the close of the seventh century. He noted that the Jordan has its rise at the roots of Lebanon, from two fountains, Jor and Dan ; that no man could sink in the Dead Sea if he tried (this is an improvement upon Antoninus) ; and that the only fruit hereabout were the apples of Sodom, which crumpled to dust in the mouth. After exploring Damascus, Tyre, and Egypt, Arculf returned home by way of Constantinople and Sicily, where he saw

**Some
Curious
Facts**

"the Isle of Vulcan vomiting smoke by day and flame by night, with a noise like thunder, which is always fiercer on Fridays and Saturdays."

Willibald, an Englishman, started from Southampton about 721 A.D., and travelled eastward by Rouen, Lucca, and the Alps, to Naples and Sicily, "where is Mount Etna; and when this volcano is in eruption, they take St. Agatha's veil and hold it towards the fire, which ceases at once." Reaching the Holy Land, he, like Areulf, saw the fountains of Jor and Dan, and, like Areulf, too, was much astonished on his way home by the flames of Stromboli. In fact, he wanted to go up the mountain, in order "to see what sort of a hell it was."

Then again, there was the monk Fidelis, who sailed up the Nile about 750 A.D., and was greatly astonished at coming upon "the Seven Barns of Joseph (the Pyramids), looking like mountains, but all of stone, square at the base, rounded in the upper part, and twisted at the top like a spire." This pilgrim, coming to the Red Sea, wished to go and look for Pharaoh's chariot wheels; but the sailors were obstinate, and hurried him on.

But, after all, exploration towards the

east was mainly by land in those early times, and so we will turn to the Atlantic, whose stormy waters had been troubled only by the hardy Norsemen since Hanno's time. It was not until the thirteenth century that the Italians took up the running. Now the Vikings had done



The crew were attacked and made slaves of by Barbary corsairs, and the whole story of their voyage was not known for forty-six years.

nothing south of Gibraltar Straits, but in 1270 the Italian Malocello discovered the Canaries, or Fortunate Islands, and Madeira; or, rather, he rediscovered them, for they had been perfectly well known to the Phoenicians. And twelve years later some Genoese galleys made their way as far south as Cape Nun, in Barbary—a puny adventure indeed as compared with Hanno's; still, we are getting on. In 1341 three ships, manned

by Portuguese, put out from Lisbon to seek the Canaries which Malocello had rediscovered. They found land on the fifth day after leaving the Tagus ; and the fleet lingered about the islands for four months. They took the Peak of Teneriffe to be 30,000 feet high, and were so terrified by it that they did not dare

A Romantic Story to land. The next piece of exploration was a very romantic story. In the reign

of Edward III. an Englishman named Robert Machin eloped with one Anne d'Arct by ship from Bristol. They had made the French coast when a furious gale sprang up from the north-east and blew them far out into the Atlantic. After thirteen days of wallowing in the sea they sighted an island—Madeira—where they managed to land in the ship's boat. The ship herself was carried away by the storm, the poor lady died of fright and exhaustion, and five days after her lover was buried beside her by the crew, who now took the ship's boat and made for the African coast, where they ran her ashore. Here they were taken and made slaves by the Barbary corsairs, and it was not till forty-six years later that the whole story of Machin's voyage was brought to Europe by a ransomed Christian.

We now come to a very important name in the history of navigation. Prince Henry, "the Navigator," third son of John, King of Portugal, having played his part in the Crusades, returned to Portugal, and was made governor for life of the Algarves, the southernmost province of the kingdom. Retiring from the court, he proceeded to carry out the great dream of his life—the dream of maritime discovery. At Sagres, near Lagos town, and almost at the extremity of that great headland known to the Romans as the "Sacred Cape," and to us as Cape St. Vincent, in sight of which Jervis won his splendid victory, Prince Henry at once began to rebuild and enlarge an old naval arsenal ; and here, with brief intervals,

for more than forty years he lived face to face with the ocean—brooding of discoveries, drawing maps, correcting instruments, issuing orders for fresh ships to be built at Lagos, and receiving the reports of his captains.

He had three aims : to put aside or penetrate the fog of ignorance that lay over the unknown world ; to enlarge his country's empire ; and to spread Christianity among the heathen. In all these three aims he was surprisingly successful, and it was he who really laid the foundations on which Diaz and Da Gama, Columbus and Magellan, Pizarro, De Soto, the Cabots, Drake, and Raleigh afterwards built.

His great idea was to find a way round Africa to India. Year after year his caravels pushed further, and yet a little further, down the West African coast, where Hanno had once taken his Carthaginian fleet ; to Cape Nun, to Cape Bojador, to Cape Blanco, to Arguin (where, time after time, numbers of his men were killed by the poisoned arrows of the natives), to Cape Verde, to Sierra Leone. The actual dangers of the journey were often less difficult to overcome than the superstitions of the seamen. The old Saracen geographers had fringed the coast of Africa with sea monsters and water unicorns, instead of place-names. They had drawn a gigantic hand of Satan raised above the waves to seize the first man who should venture beyond Cape Bojador. They told of latitudes where the sun poured down in liquid flame, and kept the sea boiling day and night. And it was the firm

Geographical Terrors
conviction of half the sailors that any white man who passed a certain point south would turn at once into a blackamoor. But Prince Henry insisted. When his captains turned back, he ordered them to return next year and try again. In 1420 Zarko, one of his captains, discovered Madeira. He it was who had picked up a ransomed Christian slave, and heard from him of the woeful



At length, after thirteen days of storms and biting cold, land was sighted ; Bartholomew Diaz had rounded the southernmost point of Africa.

adventures of Machin the Englishman, his sweetheart, and his crew. Zarko resolved to find Machin's island. Sailing round Lagos in June, 1420, he came to Porto Santo, and rested there eight days. Setting sail again into the fog, he came upon a low marshy cape, and finally to the high lands and forests of Madeira. Guided by Morales, the Christian who had brought the tale, he landed and found the wooden cross and grave of Machin and the unfortunate Anne d'Arfet. Embarking once more, he coasted slowly round, and came to a great plain covered with fennel, or "Funchal," where the chief town of Madeira has since grown up. He sent a party inland to explore, who brought word that they had seen sea on every side from the hills. So Zarko collected some specimens of the native plants and birds, and returned to Portugal.

The object of his greatest desire Prince Henry never achieved. His great captains, Nuno Tristam, Anton Gonsalvez, Diego Gomez, Cadamosto, never reached that southernmost point of Africa of which their master dreamed. Henry died in 1460.

It is a common error to suppose that the Cape of Good Hope was first doubled by Vasco da Gama in his famous voyage of 1497-99; but this feat—"the greatestfeat of discovery in all history before Columbus"—was really performed by Bartholomew Diaz in 1486, twenty-six years after Henry's death.

It happened in this way. Setting out with two little frigates, each of fifty tons burden, Diaz headed southward, resolved to persist in this direction, down the coast of Guinea, until the end of the continent was reached.

Steering steadily down the Lower Guinea coast, he passed Walisch Bay, the furthest point of his predecessors, and came to Angra Pequena, and a headland where

he set up his first new pillar. It is called Cape Diaz to this day. Still holding southward, he passed Orange River, the northern boundary of the modern Cape Colony. Then putting well out to sea, he ran for thirteen days before the wind, hoping to fetch a circle round the southern point of the continent, which by this time could not well be far off. Finding that the cold grew intense and the seas terrific, he changed his course, and steered east for five days. Then, as still no land appeared, he turned his vessel's head to the north.

At length land was sighted ahead. It was a curving bay, with cattle feeding on the shore. Diaz, from this circumstance, named it "Flesh Bay," and its eastern headland the "Cape of Cows"; and these names, too, have lasted. After putting ashore two Guinea natives that he had with them, our captain sailed east, searching in vain for the land's end. At length they found that the coast trended gradually, but steadily, northward. They had passed Algoa Bay, the first land beyond the Cape ever trodden by a Christian foot, and had pushed on E.N.E. to the mouth of the Great Fish River, a full five hundred miles beyond the point for which Diaz was daily straining his eyes. Here his crew refused to go further with him, and he turned back, certain of one thing only—that he had missed the Cape and all his labour was lost. He was coasting slowly back, weary and sick at heart, when one day there loomed before him, and disengaged itself from the mist, that magnificent promontory which, for seventy years, had been the goal of men's desires.

It was, let us repeat, the greatest of all discoveries before Columbus found America; it changed, directly or indirectly, the knowledge, the trade, the whole face of the world at once and for ever.



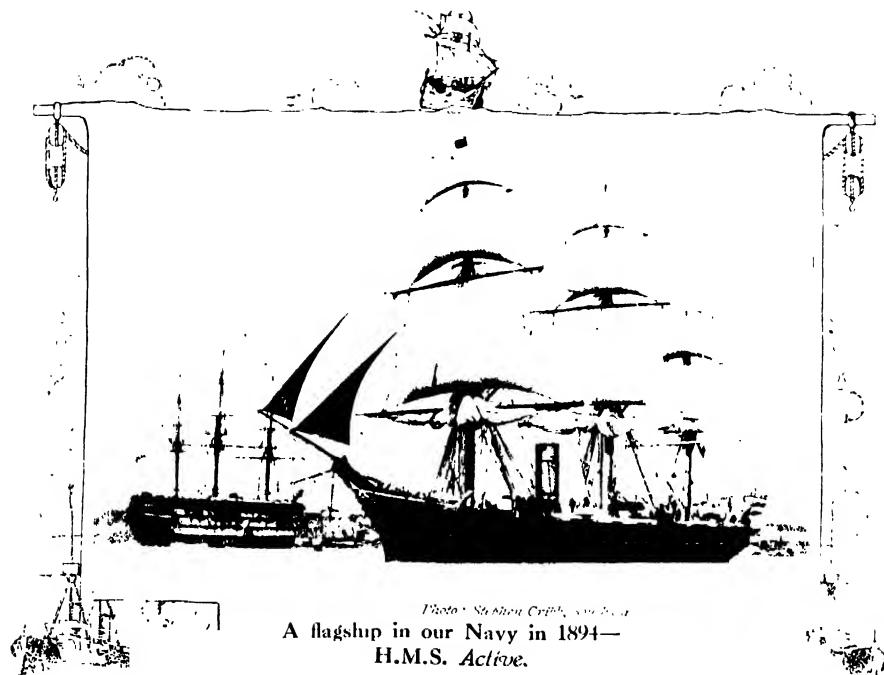


Photo: Stephen Crispe, via Getty
A flagship in our Navy in 1894—
H.M.S. *Active*.

The Birth of the Ironclad

THIE honour of inventing the ironclad belongs to the French, or rather the honour of first putting the invention into practice (unless we are to go back to Hiero of Syracuse, who covered one of his galleys with brass plates). Three floating batteries—*La Devastation*, *La Tonnante*, and *La Lare*—were used by them at the bombardment of Kinburn, in the Black Sea, during the Crimean War in 1855. These were little more than heavily-plated barges, and the Russian gunners made a pet target of one of them. Twenty-five balls struck it point-blank, with no more result than the partial displacement of one of the iron plates, which were only

an inch and a half thick. The result of this experiment was to revolutionise naval architecture.

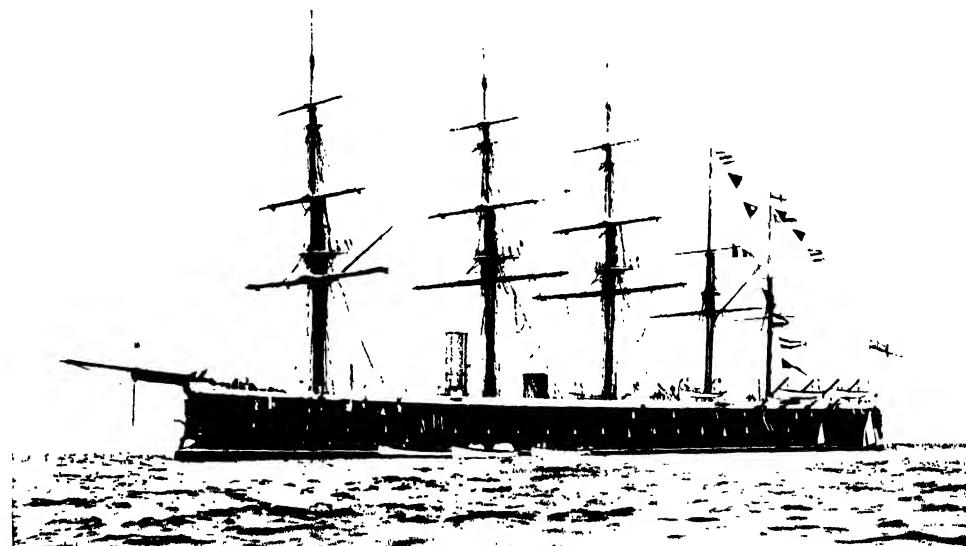
A year later M. Dupuy de Lôme prepared for the French Admiralty the plans of *La Gloire*, the first ironclad frigate. She was launched in 1857, and her architect, in asking for money to build, remarked:—"One single ship of this description launched into the midst of a whole fleet of your old vessels would be like a lion among a flock of sheep."

The English followed suit with two fine frigates—the *Warrior* and *Black Prince*, sister ships—each 380 feet long, with a belt of armour four and a-half inches thick, and a displacement of 9,100 tons. They were masted and rigged as usual. After these came ships like the

Northumberland, *Minotaur*, *Agincourt*, *Inconstant*, and *Monarch*. But the truth of Dupuy de Lôme's remark was first verified in 1862, near the outset of the great American Civil War.

In April, 1861, at the beginning of the War of Secession, a number of ships of the United States navy were lying off the Norfolk navy-yard in the James River, Virginia. The Southerners managed to pen these in by crowding the channel with sunken hulks. In the end a few

to pump the ship out and float her into dry-dock. At first the hulk was regarded as nearly worthless; but after a while her captors hit on the idea of patching her up and fitting her out as an ironclad. They provided her with an iron ram, capable of dealing a severe blow under water. Her hull, cut down to within two feet of the water-line, was covered by a bomb-proof house with a sloping roof, the iron plates upon which were four and a-half inches thick. While the hull



H.M.S. *Agincourt*, a fine example of the transition stage between steam and sail.

ships only escaped; among them the *Cumberland*, with which our story is partly concerned. The rest were either scuttled or set on fire—three line of battleships, the *Pennsylvania*, *Columbus*, and *Delaware*; four frigates, the *Merrimac*, *Brandywine*, *Columbia*, and *Raritan*; one sloop-of-war, the *Germantown*, and the brig, *Dolphin*—in all one-fourth of the American navy. Of these the *Merrimac*, a steam frigate, had at first been sunk in shallow water, above which her gun-deck showed. When she was afterwards set fire to only her upper works were burned. Consequently, when the Southerners came on the scene, it was no very difficult matter

to pump the ship out and float her into dry-dock. At first the hulk was regarded as nearly worthless; but after a while her captors hit on the idea of patching her up and fitting her out as an ironclad. They provided her with an iron ram, capable of dealing a severe blow under water. Her hull, cut down to within two feet of the water-line, was covered by a bomb-proof house with a sloping roof, the iron plates upon which were four and a-half inches thick. While the hull

the *Cumberland* especially being a beautiful type of the wooden frigate in the last age of wooden battleships. But on that day wood was proved to be of little avail against iron, however heroically defended ; and there is little doubt that the officers of the *Cumberland* and *Congress*, at any rate, knew the forlorn hope that lay before them, as soon as the *Merrimac* hove in sight on the memorable 8th of March, 1862.

boats at the booms, and the sailors' clothes hanging to dry in the rigging. The *Cumberland* rode at single anchor, with her sails loosed to dry, when a half-hour after noon she spied the enemy. Soon the sails were furled and all hands beat to quarters—as fine a crew as ever manned a ship ; “a crew,” writes one of their officers, “that, knowing no surrender, could they have had a motive power other than sails, would have whipped the



Two fine types of our Navy in bygone days H.M.S. *Victory* and H.M.S. *Devastation*, both equally obsolete.

The engagement was fought in the Hampton Roads, which was virtually an outlet of the James River. Like the Thames, the James River broadens out into many shallows at its mouth. The *Merrimac* left the Norfolk navy-yard (which holds to the James River somewhat the same position that Sheerness does to the Thames) early on the morning of the 8th, and steamed steadily down on the enemy's fleet, accompanied by some smaller vessels of war and a few tug-boats.

It was a beautiful spring morning, bright and clear. The *Merrimac* was not expected, for the frigates lay with their

Merrimac by the sheer force of their battery and their determination to conquer.” They had a chance to display all their heroism, though in a vain cause. “The engagement,” wrote the Confederate Secretary of the Navy, “commenced at half-past three p.m. ; and at four p.m. Captain Buchanan had sunk the *Cumberland*, captured and burned the *Congress*, disabled and driven the *Minnesota* ashore, and defeated the *St. Lawrence* and *Roanoke*, which sought shelter under the guns of Fort Monroe. Two of the enemy's small steamers were blown up, and the two transport steamers were captured.” As regards time this is a

mild exaggeration, but is correct in the main.

The *Merrimac* began, shortly before three, by heading directly for the *Congress*, giving her a broadside and receiving one in return, the balls of which rattled from her sides like hail upon a roof. She then moved slowly across the bows of the

A Lion Among Sheep

Cumberland and man-
œuvred for position
to ram, training mean-
while her forward

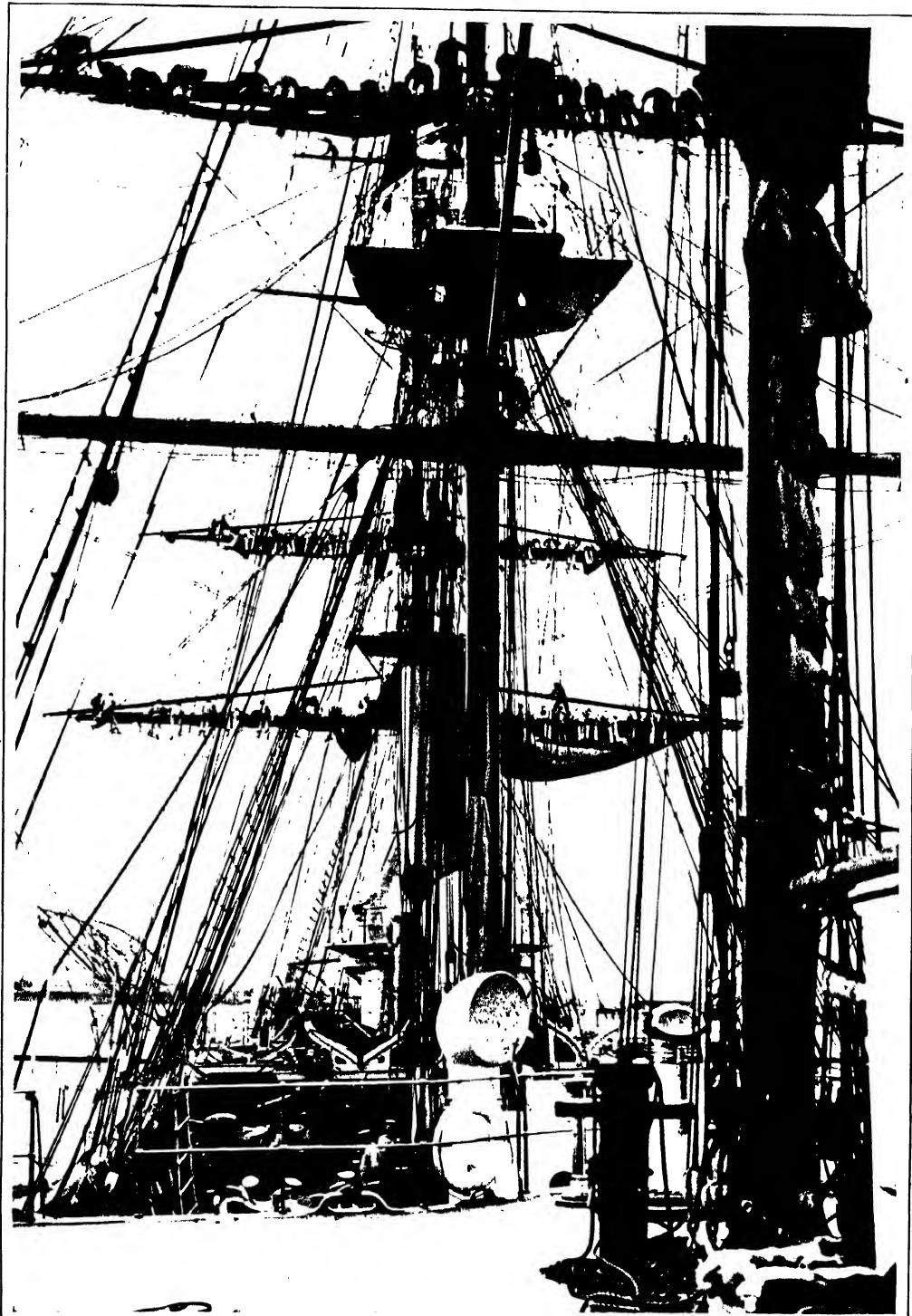
guns upon the doomed ship. Her first shot passed through the starboard hammock netting, killing and wounding nine marines; and for some time, from a distance of about 300 yards on the starboard bow, she continued to rake the *Cumberland* with every shot. The frigate could scarcely reply, being unable to use the wind to get into position. The second shell from the *Merrimac* burst among the crew of a gun that was being run out, destroying everyone except the powder-man, and disabling the gun for the rest of the action. The captain of this gun, a seaman named Kirker, had both arms taken off at the shoulder, but set his teeth and allowed not a groan to escape him as he was carried below. Not a man flinched; the dead were thrown over on the other side of the deck, and their places taken quietly, each man loading and firing as fast as the guns would work.

This carnage lasted for some fifteen minutes, when the *Merrimac* headed for the *Cumberland*, striking her on the starboard bow, knocking two of the ports into one, and driving her ram into the frigate below the water line. Having done this, for awhile she could not free herself, and the sinking *Cumberland* began to bear her down until the water was over the forward deck. "Had the officer forward on the spar-deck of the *Cumberland* had the presence of mind to let go the forward-anchor, it would have fallen on the *Merrimac's* decks and she would have been carried down in the iron embrace of the *Cumberland*." But the chance was

missed; the weight of the ram broke it off in the *Cumberland's* side, and the *Merrimac* swung round broadside to the frigate. This was the Federal ship's first chance, and she at once poured in three solid broadsides, but with little effect, except to cut off the *Merrimac's* flagstaff, and thus bring down the Confederate colours. None of her crew ventured to replace them, and she fought thenceforward with only her pennant flying. But the *Cumberland* was sinking rapidly. As the water rose on the berth-deck, which by this time was filled with wounded, terrible cries went up from these poor wretches above the din of the battle. The *Merrimac* hailed and asked, "Will you surrender?" The answer went back: "Never. We will go down with our colours flying." Hearing this, the Southerner opened fire again, and in a few minutes rammed her enemy a second time—a needless stroke. The *Cumberland's* deck by this time was covered with dead and wounded, and slippery with blood; some of the guns were run in as they had last been fired, many of them bespattered with blood; broken rammers and blackened sponges lay about in every direction. Still the men fought on, each anxious for "one more shot." At last the order was given for every man to look out for himself. Even then, and as the waters closed over the *Cumberland*, the last gun was heard. It was fired, though half under water, by the coxswain, Matthew Tierney, who perished with the ship. Among the last to leave was Lieutenant Thomas O. Selfridge, who tells us that he at

With Colours Flying

first tried to escape by the ward-room hatch ladder, but found the hatchway blocked by a fat drummer who was struggling up with his drum, and was afterwards picked up using it as a buoy. Selfridge then threw off his coat and sword and squeezed out through one of the portholes. Carrying scores of poor fellows, the frigate plunged head first, with her stern high in air, and her flag



P. G. T. G. & P. G. T. G. T. G. T. G.

Before steam ousted sail from the Navy : Unfurling sails on H.M.S. *Calliope*.

still flying from the peak. The whole number lost was not less than 120 souls. Her top-mast reached high above the water, and her flag was left to wave over the dead who had defended it with their lives.

The *Cumberland* being thus disposed of, the *Merrimac* turned her attention to the

A Desperate Struggle *Congress*. The South-
erners, it may be mentioned in passing, generously forbore

to fire on the boats, or on the small steamer, which were now engaged in picking up the survivors of the *Cumberland*'s crew. The officers of the *Congress*, seeing their comrades' fate, determined that the *Merrimac* should not at least sink their vessel. They therefore crammed on all sail, and attempted to run ashore; but the *Merrimac* was soon close on them, and delivered broadside after broadside at less than 100 yards' distance, doing terrible execution. The *Congress* responded pluckily, but with little effect. One shot is supposed to have entered a port-hole of the ironclad and dismounted a gun, as there was no further firing from that port, and a few splinters of iron were ripped off her roof; but this was all. The guns of the *Merrimac* had apparently been specially trained on the after magazine of the *Congress*, and shot after shot entered that part of the ship. Thus, slowly drifting down with the current, and again steaming up, for one hour the *Merrimac* continued to harass her opponent. Several times the *Congress* was on fire, but the flames were kept under. At length the ship was on fire in so many places, and the flames gathering with such force, that her officers, seeing that to keep up the defence any longer would be vain, and even suicidal, hauled down the Stars and Stripes and hoisted a white flag at the peak. For some minutes this was not discerned through the clouds of smoke, and the firing went on. At length, however, the broadsides ceased, and a tug that had followed the *Merrimac* out of Norfolk came alongside the *Congress*, and

ordered the officers on board. They refused, hoping that from the nearness of the shore they would be able to escape. About forty of the men, thinking that the tug was one of the Northern (Federal) vessels, rushed on board, and were, of course, soon carried off as prisoners. By the time that all the able men were off, ashore or elsewhere, it was seven o'clock in the evening, and the *Congress* a bright sheet of flame from stem to stern, her guns, which were loaded and trained, going off as the fire reached them. A shell from one struck a sloop at a little distance, and blew her up. At midnight the fire reached her magazines, containing five tons of gunpowder, and all that remained of the *Congress* was hurled into the air, with a terrific explosion.

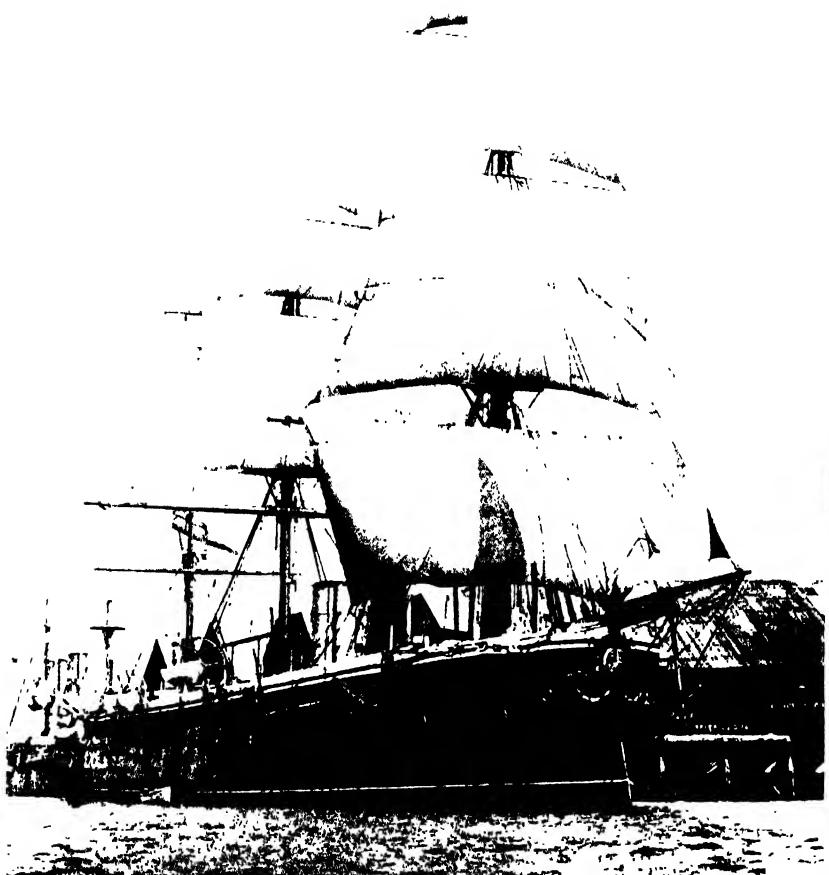
Two ships were thus accounted for, and the *Merrimac*, about five in the afternoon, started to tackle the *Minnesota*, desiring rather to capture than to destroy her. She therefore stood off about a mile, and threw shot and shell at the frigate till nightfall, doing considerable damage. One shell entered near her waist, passed through the chief engineer's room, knocking two rooms into one, and wounded several men; another shot passed through the main-mast. As dark drew on, the *Merrimac*, satisfied with her afternoon's work, steamed on under Sewall Point. "The day," said the Baltimore *American*, "thus closed most dismally for our side, and with the most gloomy apprehensions of what might occur the next day. The *Minnesota* was at the mercy of the *Merrimac*, and there appeared no reason why the iron monster might

A Terrible Afternoon not clear the roads of our fleet, destroy all the stores and warehouses on the beach, drive all our troops into the fortress, and command Hampton Roads against any number of wooden vessels the Government might send there. Saturday was a terribly dismal night at Fort Monroe."

But the tables were about to be turned. About nine o'clock that night Ericsson's

battery, the *Monitor*, entered Hampton Roads. She looked a foolish and not very formidable craft. She lay low in the water, and might have been taken for a raft, having nothing above board but a

was believed that no shot could hurt this lower hull on account of the angle at which it must strike it. The turret amidships an iron cylinder, nine feet high and twenty feet in diameter, eight or nine



H.M.S. *Minotaur*, a fine example of the early iron ships of the Navy.

round turret amidships, a small pilot-house forward, and a diminutive funnel aft. It was only on board that her real strength could be discovered. She carried armour about five inches thick over a large part of her, and had practically two hulls, the lower of which had sides inclining at an angle of 51° from the vertical line. It

inches thick throughout and about the port-holes eleven inches—revolved by steam power. When the two heavy Dahlgren guns were run in for loading, a kind of pendulum port fell over the holes in the turret. Her propeller, rudder, and even her anchor were hidden.

It was now the turn of the Southerners

to be puzzled. The *Merrimac* and the *Monitor* smelt up towards each other cautiously, neither seeming to know exactly what to make of her antagonist. Not a soul was to be seen on board either vessel. The first shot from the *Monitor* was fired when about 100 yards distant from the *Merrimac*, and her distance was afterwards reduced to fifty yards; and at no time during the furious cannonading that ensued were the vessels more than 200 yards apart. The scene was in plain view from Fort Monroe, and in the main facts all the spectators agree. At first the fight was very furious, and the guns of the *Monitor* were fired rapidly. She carried only two to her opponent's eight, and received two or three shots for every one she gave: only these shots appeared to have absolutely no effect upon her. Finding she was much more formidable than she looked, the *Merrimac* attempted to run her down; but her superior speed and quicker handling enabled her to dodge and turn rapidly. Once the *Merrimac* struck her nearly amidships, but only to find that she was as hard to run down as to shoot down. She spun round like a top; and, getting her bearing, quickly sent another of her big shots into the *Merrimac*.

The officers of the *Monitor* were begin-

ning now to handle her with confidence, and no longer fired at random. "The fight," said an eye-witness, "then assumed its most interesting aspect. The *Monitor* went round the *Merrimac* repeatedly, probing her sides, seeking for weak points, and reserving her fire with coolness until she had the right spot and the right range, and made her experiments accordingly. In this way the *Merrimac* received three shots. . . . Neither of these three shots rebounded at all, but appeared to cut their way clear through iron and wood into the ship." Soon after receiving the third shot the *Merrimac* had had enough, and made off at full speed; nor was the contest renewed.

With that terrific battle commenced the long war of guns *versus* armour that has not ceased for a minute since that day. At present the victory is thought to be with the guns, but that depends, of course, upon the range at which the next naval battle is fought. No armour that can at present be carried by a warship could withstand the direct impact of an armour-piercing shell fired from a twelve-inch gun 3,000 yards away. But here we have the great question again: What will be the range of the next naval battle—if it ever comes?



The historic fight between the *Merrimac* and the *Monitor*.

The Wreck of the "Stella"



The Albert Medal.

ONE HUNDRED AND TEN passengers were on board a special train that left Waterloo at five minutes to nine in the morning of the day before Good Friday, 1899. At Southampton the London and South Western Railway Company's steamer *Stella* received the excursionists, and with thirty others, raising the number to 140, and an efficient crew of forty-three of all ratings, she steamed out into the Channel, bound for Guernsey.

This Easter trip was the opening daylight run of the season to the Channel Islands, and the *Stella* began to reel off the first knots of her voyage barely ten minutes behind the advertised time. A gentle south-west breeze was blowing; the weather was fine, and the Needles, sure indicators of the state of the atmosphere, stood out sharply on the port bow. The staunch little vessel settled down to her run of 120 miles. She was schooner-rigged, a Clydebank steel steamer, about nine years old, and built at a cost of over £60,000. Her engines were 195 horse-power, and she could do a bit more than eighteen knots an hour.

Experienced travellers in the smoking-room, who knew the popular boat and

her still more popular Captain Reeks, soon began to enlighten the passengers who were making the voyage for the first time as to the vessel's speed and the prospective time of arrival at the Guernsey port. General opinion gave the speed as seventeen knots per hour.

"She's doing more than seventeen, I should say," declared an old traveller; "but we can soon settle it. Here, boy, take my compliments to the engineer officer-in-charge, and ask for the speed."

After a short interval the reply came, "Eighteen knots," and the passengers congratulated themselves, and told each other, when someone brought word of a suspicion of haze on the water, that Captain Reeks was so experienced in the navigation between Southampton and the Channel Islands that he could take his ship to Guernsey blindfolded. In the afternoon the haze became thicker, and the speed was reduced; but eventually the weather cleared and full speed ahead was signalled from the bridge. The passengers, without the slightest fear or alarm, settled down for a few hours of comfort.

In the saloon Bening Arnold, with his brother Claude, were playing chess with the second officer. The two lads had evolved a plan of campaign and made a bold attack.

"Your move, Mr. Reynolds," cried the elder boy.

The second officer smiled and made a masterly move that threw the youngsters into consternation.

"Now I have you on toast," he said, and went on deck, leaving the young Arnolds to calculate how many moves their opponent must make before mating.

Reynolds reached the deck about twenty-five minutes to four o'clock, and found that a thick haze was shrouding the sea, and the *Stella's* fog whistle was sounding warningly. The captain and the first officer, Mr. Wade, were together on the bridge. In the ladies' saloon a little nervousness prevailed, and something was said about the possibility of a collision; but Mrs. Rogers, the cheery, capable stewardess, had a bright smile and reassuring words for all. Her fearless spirit,

are in constant danger of all sorts of dreadful accidents?"

Mrs. Rogers could speak from nearly sixteen years' experience of sea-going, and she answered such questions readily enough, with the object of diverting the minds of her charges from nervous apprehensions.

"It took me five years to get used to the sea," she said with a smile. "That was rather long, and a stewardess may become a good sailor in a month or so."

This last sentence had been added for the encouragement of Ada Preston, an understewardess who was on her first sea voyage.

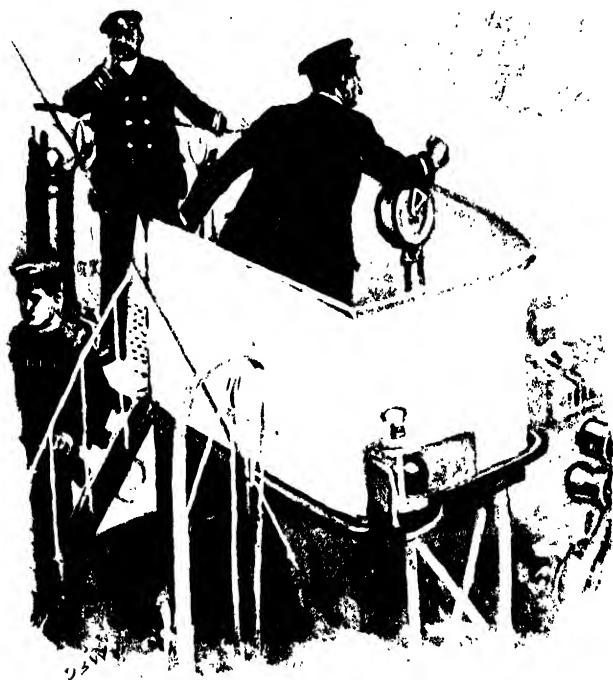
"You have grown-up children, Mrs. Rogers. I'm sure they would like to have you with them," said an old patron of the South-Western boats.

"No mother ever had better children," said the stewardess with loving pride. "This summer my only daughter is to be married, and afterwards I shall be with the young couple for a time; but I must not give up my work until my boy is out of his apprenticeship, and that will not be for three years."

"I have crossed to Guernsey with you many times, Mrs. Rogers," said another passenger; "but I have always seen you cheerful under all provocations and in all weathers."

"I don't believe in being miserable. A sad face never did anybody any good," said the kindly stewardess; "and, you see, ma'am, it's such a pleasure to be able to help others."

This revelation of her hopes and the



Rocks, grim and defiant, seemed to leap out of the haze. Captain Reeks recognised his peril instantly. The *Stella*, far out of her course, was bearing down on the Casquets.

no less than the genuine kindness and sympathy that shone in her honest eyes, made her an ideal comforter.

"How can you keep up your spirits in all weathers, night after night, when you

altruistic motives that governed her unswerving kindness, was not made to a chance passenger, but to one of her "ladies" in whom she had the greatest confidence.

In the dense fog that enwrapped the Channel all the usual landmarks were invisible. The lighthouse on the Casquets,

The Fog Shuts Down which on a clear night throws a beam that may be seen fifteen miles away, was powerless to penetrate the gloom. Captain Reeks, with Mr. Wade and Mr. Reynolds, stood on the bridge, with eyes and ears alert, and every faculty strained to the utmost. Suddenly, about four o'clock, the blast of a siren was heard on the port bow, and Hartop, A.B., the lookout forward, gave the warning shout,

"Land ahead!"

Rocks, grim and desiant, seemed to leap out of the haze. Captain Reeks recognised his peril instantly. The *Stella*, far out of her course, was bearing down on the Casquets, dreaded by every sailor that crosses the Channel.

"Port: hard-a-port!" rang out the captain's order. Reynolds immediately telegraphed to the engine-room to stop the starboard engine and then to send the boat full speed astern. Nothing could have been done more promptly. The *Stella* came round swiftly to starboard, almost grazing L'Anquiere. She ran clear for nearly a couple of lengths; then there was a long, grating sound as she crashed upon a reef eight feet under water at the foot of little Le Noir rock.

The terrible nature of the disaster was known at once to everyone on board the vessel. Cowardly panic is infectious, but so is heroism, and the gallantry of the crew, from the captain down to the captain's boy, was emulated by the pale-faced passengers.

"Stations!" came the captain's order, and each man in the crew, who had been given boat drill every fortnight, sprang to his place.

"Close water-tight bulkheads!" called

the captain. "Serve out lifebelts! Now, Mr. Wade. Hurry up with the boats!"

Down among the passengers went Chief-Officer Wade.

"Keep cool," he said, "there is plenty of time. Everyone will be saved. Ladies and children first."

The order was met by a responsive cheer, and the word was passed along the decks, "Women and children first." Coolly and swiftly the stewards distributed lifebelts, of which there was no lack. The engineers closed the watertight bulkheads and stopped the engines, then with their men they came on deck. Nothing more was to be done below, and the sea was coming in, welling up over the footplates. As a whole, the sea was calm, but the swirl over the rocks of the Casquets never ceases, even in the gentlest weather.

The starboard lifeboat was swiftly launched and brought round to the gangway, and two sailors were ordered on board her. Then came the time that tried the souls of all aboard. Many women and children, in a state of terrified docility, took their places at once, and the boat was quickly filled and pushed off a few yards, where it stood by. The cutters and the port lifeboat were filled, and the dinghy got away. According to the stories of survivors, not a man stirred to save himself until all the women who consented to leave the ship had been provided for.

Some of them, white-faced and terrorstricken, clung to their husbands and refused to go. One mother stayed on board with her two schoolboy sons and perished.

Mrs. Arnold called her boy to her side, and, passing the lace of the football he was carrying through the buttonhole of his waistcoat, tied it securely. Bening Arnold's life was thus saved by his mother's affection and presence of mind.

Which was worse, to go or stay? Women had to be tenderly persuaded to enter the boats. Some of them were

**Presence
of
Mind**

The Sea and its Story

compelled by affectionate violence. One father threw two of his little ones into a boat as it moved away, and both the children were saved.

Two women saw a deeply-laden boat push off, and cried in agony :

"They have gone ! They have left us ! We are lost ! We are lost !"

"**We are Lost !**" "Ladies, you are mistaken," came the suave voice of First Officer Wade, who had

acted with nerve and cheerfulness during the crisis. "Your boat's ready on the other side."

We have learned to expect cool heroism in officers and men whenever disaster overtakes a British vessel : in the case of the *Stella* the bravery extended to every servant on board. The stewards rendered splendid aid in getting the women and children into the boats ; the "master's boy," like the midshipman of the *Victoria*, refused to leave his post, and stood by the captain till the end. But above all was the heroic devotion of the stewardess, Mrs. Rogers.

When the *Stella* crashed on the rocks, Mrs. Rogers, knowing well the danger in which the ship was placed, checked all signs of panic and induced all the ladies to wrap themselves in the warmest garments they could lay hands on. The ladies' saloon was a long apartment, with a narrow door leading round an awkward corner : an exit likely to be blocked up in the event of a panic ; but Mrs. Rogers soothed, hurried, and directed her charges without any unseemly crowding, until they were all standing at the side of the ship, awaiting their turn in the boats. On deck she gave valuable help in fastening on the available lifebelts.

A well-laden boat, actually the last to get away, was waiting for Mrs. Rogers to take her place when another lady came to that side of the deck. The stewardess turned from the rail and noticed that the late comer had no belt. In an instant she had removed her own and tied it round the passenger. Then she handed her

down into the crowded boat, and stood back.

"Jump in, Mrs. Rogers !" excitedly urged the sailors, who were at the oars. "Jump in !"

"No, no," replied the brave woman ; "if I get in the boat will sink. Good-bye ! Good-bye !"

Then, as she felt the steamer slipping from the rock, she lifted up her hands to heaven and cried, "Lord, have me !"

In another instant the *Stella* was in deep water. There was a very brief interval, and then she dived stern foremost beneath the waves, carrying with her all who had remained aboard. All might have been saved, for there were boats in plenty, if there had been time to launch them ; but the precious moments slipped rapidly away, and as the ship disappeared a boat-load of passengers was carried down with her in the swirling vortex. Captain Reeks was on the bridge with the chief engineer and the steward when the end came. As the *Stella* shuddered before the final plunge, the captain, apprehensive that some of the boats might be drawn down, raised his voice in a last order.

"Pull, men !" he thundered. "Pull for your lives !"

All the engineer officers were lost, and of the firemen but two were saved, and these only by clinging to an overturned boat as the steamer sank. The sea was dotted with struggling people, and of these only eight survived the night. The port lifeboat floated bottom upward and some men clung to her keel. A wave righted her and four men scrambled on board and got out the oars.

Shortly afterwards they were able to rescue young Arnold and a few others who were swimming about. The boy was only about fourteen years of age, but he was a good swimmer, having taken prizes for swimming at the London Polytechnic. When thrown off the bridge into the water he took a deep breath before the suction of the sinking steamer dragged him below. He declared

The Great Disaster

The Wreck of the "Stella"

that before he could regain the surface he felt as though his lungs would burst. His own efforts and the inflated football which his mother had fastened to his waistcoat brought him up to the light once more, and after swimming about for a time he was dragged into the port lifeboat.

Waist deep in water—for the little vessel was water-logged—the unfortunate men drifted and rowed all night. Repeated attempts were made to find the vent-holes that they might be plugged and the boat bailed, but the numbing coldness of the water frustrated all efforts in this direction. The sufferings aboard were frightful. No fewer than six men died from exhaustion before the morning broke. A ship was sighted, but the hapless men could not attract her attention.

The boat drifted past Ormouyville La Hague, which Arnold, who had spent his last summer holidays in the Channel Islands, recognised at once. At Gardlehen a keen-eyed coastguard sighted them, and semaphored the news to Cherbourg, whence the French Government tug *Marsouin* was immediately despatched by the Préfet Maritime. The tug scoured the waters and was seen by the *Stella* survivors a long time before the Frenchmen noticed them, for the water-logged boat was almost invisible at a short distance. At length the zigzag course of the boat brought her close at hand, and at a quarter to two on the after-



The stewards rendered splendid aid in getting the women and children into the boats.

noon of Good Friday the cold, starved, and exhausted survivors were taken on board.

The French veterans who manned the tug treated the sufferers in the kindest manner. They had prepared hot blankets and warm clothing, and also suitable nourishment, which they administered during the hour's run back to Cherbourg. Many of the kindly Frenchmen, in their enthusiastic humanity, even stripped off some of their own warm garments, and drew them over the bodies of the pallid Englishmen to help their charcoal fires to bring back the glow of life.

Young Arnold was delirious for a time, and the four passengers and three men of the crew who had survived the awful

experience of the night were in a piteous state of collapse. They tried to express their thankfulness to the crew of the *Marsouin*, and some months later they sent to Cherbourg a telescope and fourteen watches for their rescuers. These tokens of gratitude were presented by the British Consul, and our Government made warm acknowledgment of its debt to the authorities of Cherbourg.

The passengers in the other boats were compelled to endure the perils and terrors of the night amid rocks and fierce currents, made more dangerous than usual by the veil of mist that hid them from sight. Yet they were dry and comparatively warm, and did not experience anything like the terrible suffering that fell to the lot of Arnold and his companions on board the waterlogged lifeboat.

When the second officer, Reynolds, was thrown into the sea by the downward plunge of the *Stella*, he struck out, and, after a hard swim, reached the starboard lifeboat. He and two other swimmers were dragged in, and he immediately took charge. The look-out man and the sailors were on board, so that his arrival raised the number of the crew to four, while the passengers numbered thirty-one. Thirty-five in all, making the starboard lifeboat the heaviest-laden of all the boats that got away.

The port cutter managed to keep in company with Reynolds's boat throughout the night. On board this boat there were four men of the crew to twenty-six passengers.

During the fifteen hours of danger and discomfort the passengers maintained an outward equanimity. One lady insisted on rowing and kept sturdily at her oar all night. The other ladies bore up courageously, and talked cheerfully on various topics.

At two o'clock in the morning the sea got up, but the boats remained dry; and Colonel Dixon, by burning matches at short intervals, enabled the two little vessels to keep together. When the fog lifted, Reynolds decided to make for Guernsey; but down came the haze

again and the idea had to be abandoned. After daybreak the fog lifted once more, and, to the joy of the shipwrecked passengers and crew the *Vera*, a sister ship to the *Stella*, was sighted.

As the boats came alongside the *Vera* many of the passengers in the boats rose to their feet, and the captain shouted from above in stentorian tones, "Sit down, for Heaven's sake, and I will get you all on board safely." The long-suffering people sank down again, and by seven o'clock they were safely resting below the steamer's decks, and their terrible ordeal was over.

The half-dazed faces of the survivors were covered with salt; there were a few cases of collapse, but no physical injuries. The lady who had rowed so cheerfully during the night fainted as soon as she felt the deck planks of the *Vera* beneath her feet.

Twenty-five pounds were immediately subscribed by the *Vera* passengers and presented to Reynolds and his men. In the wreck inquiry, held before Mr. Marsham, the courageous conduct and cool judgment of the second officer were appreciatively noted in the finding of the court.

Out of the 183 souls who sailed from Southampton on that Easter excursion sixty-nine perished. Of the crew of forty-three the saved numbered twenty-three. There were 140 passengers, and of these 111 reached their homes again.

Subscriptions were raised to relieve the widows and orphans of the crew, and from Havre, with a contribution, came a generous recognition of the splendid heroism of British seamen. A special fund was started in honour of Mrs. Rogers. Of the money subscribed the sum of £250 was used for the benefit of her aged father and her children, while another £250 was devoted to a simple permanent memorial, which in June, 1890, the Mayor of Southampton accepted in the name of the town. It took the form of a large stone seat, overlooking the sea and the shipping, and it bears an inscription telling the tale of the brave woman's noble conduct in the face of danger and of death.



DAVID B. WATER

The *Stella* dived stern foremost beneath the waves, carrying with her all who had remained on board.



One of the earliest of our submarines running on the surface.

Photo: A. J. M. G.

War and the Submarine

SUPPOSE it is wartime! Suppose an enemy's fleet is advancing to destroy one of our naval bases. Scouts have brought in the news flying hot-foot up Channel in front of the advancing battle fleet, and though the only battleships of ours at the base are disabled and out of action, there is no feeling but one of confidence among all concerned in the defence of the port

Wireless messages report the nearer approach of the enemy, and presently from the tidal basin a line of dots moves out to meet them. At least they appear as dots to those on shore; but near at hand the dots would appear as the superstructure of a fleet of submarines. The advancing fleet can see nothing, for the dots merge themselves into the indefinite blue grey of the Channel sea, and are invisible at a very short distance.

At a speed of about fourteen knots the line of dots advances towards the rapidly approaching battle line. It is a curious contrast. On the one hand we have a line of great ships, "Dreadnought" cruisers and battleships, and on the other an array of what looks like nothing so much as inverted pails. Dare these pails threaten the mighty battle fleet that is rushing towards them at so great a speed?

Suddenly we rub our eyes; the inverted pails have disappeared, and left not a trace behind. No, that is wrong. Where the pails had been a line of hop poles is settling into the water until only about a foot and a half of each remains above the surface. These hop-poles are the periscopes of our submarines. Steadily they advance, but more slowly now.

Suddenly the battleship line turns to the right, and as if turned by the same order the line of hop-poles turns in the

same direction. The two contrasted fleets are but about half a mile apart now. Bells and swift commands break the ordinary calm of the battleship line, flags fly up from the signal bridge of the flagship, and a semaphore gets to work madly. The naval Goliaths have discovered the Davids that are advancing against them.

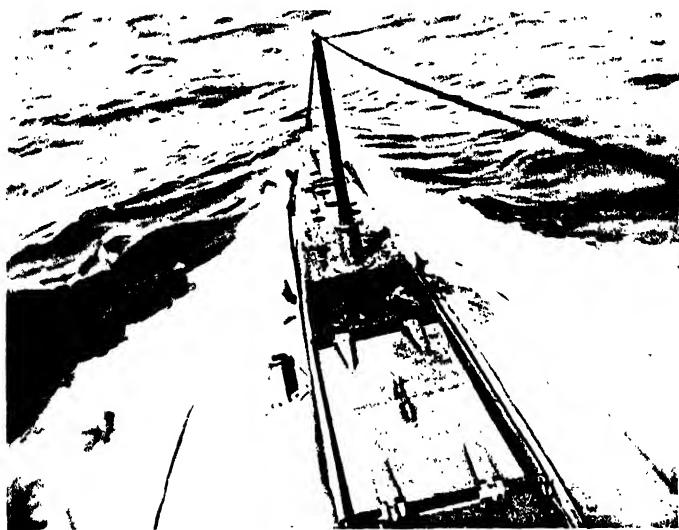
Orders are sharply given and instantly obeyed, but the heart has gone out of that giant organisation of power. Where formerly confidence and eagerness showed on the faces of officers and men, there is now only anxiety and fear. Eyes are directed towards the waves, trying to pierce the surface so suddenly filled with underwater menace.

Immediately after the first hoist of signal flags "broke out" from the Admiral's vessel one of the tiny hop-poles that had strung out across their course tilted sharply back, quivered for an instant, and then regained its poise. That was all, but two seconds later a small cloud of spray appeared just off the side of the flagship, followed by a tremendous thud and spurts of black and yellow smoke from out the boiling waters. The great steel monster trembled from stem to stern and gently heeled over till the decks tilted down on the wounded side at a sharp angle, and its powerful guns were rendered useless. The advance battleship line is now charging straight ahead at full speed, leaving the disabled flagship behind—charging ahead at nothing more tangible, it would seem, than a line of

bobbing hop-poles, so small and slender as to be almost invisible.

The latter line is broken now. Some of the submarines dart this way and that, and now and then they tilt back and then lunge forward, and with each lurching, quivering movement there follows, a moment later, that same heaving spurt of spray, and now and then a disastrous dull thud as another and another ship heels over.

The two lines meet—the great and the tiny—in less time than it takes to tell it. Rather, they seem to meet only, for almost at the point of contact the posts disappear entirely and the mighty attacking line sweeps on and over them. Now they reappear, bobbing up one by one in the breach between the flying advance line of the fleet and the rear guard of ships, which has held back and is now swinging about to steam out of danger. Here the posts reappear, a number turning and streaking after the advance



A curious view of a submarine at sea: the photograph was taken from the conning-tower.

line, now entrapped between the shoals of the French coast and the darting-under-water enemy, and others speed-

ing after the rear guard, now in full flight.

The battle is over. All the entrapped



Getting into the emergency dress.

vessels have surrendered, and the rest are in full flight. A fleet costing between fifty and sixty millions of pounds has been cut to bits by a handful of submarines costing comparatively nothing.

Now to get on intimate terms with the tiny wonder that has worked this miracle. Wisely, our

Government will allow no one to describe the interior mechanism of our submarines; but the American naval authorities are not so particular, and since their type of boat, the *Holland*, is essentially the same, we may quote a description published in the *New York Herald* last year.

A boat it is called (says the writer), but it is unlike any boat that ever was built. Within the hull a yellow light gleams murkily from incandescent globes placed here and there, and shows the interior, which resembles the bolted sectional steel lining of an under-river tube.

The light is unearthly, the sound still more so. As the boat dives there is heard the patter of drops as of a heavy rain. The noise grows almost deafening. The dropping of a small nail upon the outside of the steel hull sounds within like the clang of a bell. The note of a distant submarine signal resounds with the heavy mournful boom of cathedral chimes. And over all is the exaggerated whirr of electric fans and motors and the "pop-pop" of petrol and air-driven machinery exhausts.

Fore and aft of the manoeuvring-compartment there are large steel tanks, which can be filled with water from intake cocks or emptied by compressed air from within. These are the ballast tanks. When full they sink the hull so that only the periscope is visible; when empty the



Emerging from the conning-tower.



Floating on the surface with window open.

boat is "light" that is to say, its conning tower, surrounding superstructure, and a portion of the hull ride above the water.

But even when the ballast tanks are full the boat has a reserve buoyancy, very slight, only about 200 lbs. to 200 tons

displacement, but enough to bring the boat "awash" to the surface under normal conditions.

The diving, therefore, is accomplished not by adding weight, but under propelling power, added to an inclined position.

The centre of the boat is normally unstable in a fore and aft direction, like a sluggish seesaw. Hydroplanes, like

does and a steel tube for discharging them. The impulse for discharge is secured from compressed air flasks within the middle compartment. Each torpedo, let us say, has a range of 1,000 yards, a speed of 35 knots, and the destructive part, weighing about 600 lbs., consists of an eight-inch gun firing a 250-lb. projectile with a velocity of 1,000 feet a second.



A moored fleet of submarines, showing on the right the very latest type of British submarine.

broad, short oars, are fitted at the middle of the boat, and at the stern there are powerful tilting rudders. When the latter are raised and the nose tipped down the impulse of the propeller sends the strange craft down upon its diving course. It is built to withstand the pressure of 300 feet of depth. General manoeuvring, however, is confined to less than fifty feet of water.

In the nose of the boat there are tucked away from five to eight Whitehead torpe-

In appearance the torpedo is not unlike a miniature model of the boat which carries it.

By its very nature, work in a submarine is extremely hazardous, and the sailor who volunteers for one of our "Dreadnought" destroyers takes his life in his hands. However, clever minds have been at work devising means whereby the lives of our brave submarine sailors may be safeguarded.

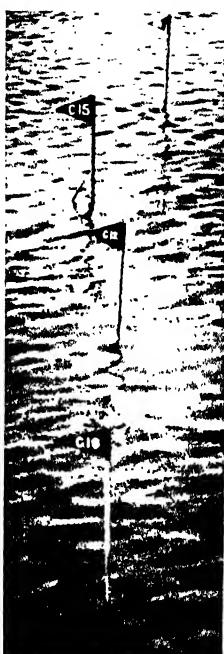
By the courtesy of Messrs. Liebe, Gorham & Company, the famous diving and submarine experts, we are enabled to give photographs and to describe the very latest invention for enabling the crew to escape from a sunken submarine. Briefly, it consists of a modified diving helmet attached to an air-proof jacket that can be secured round the waist.

These dresses are hung in an "air lock"—a compartment so arranged that even when the boat is full of water everywhere else there is still air in the "lock." If disaster has overcome the submarine, the crew repair to the air lock, don an emergency dress, emerge from the conning-tower hatch, and float to the surface. It is very simple, and the experiments that have been made show it to be efficient. In the picture on page 238 the conning-tower hatch from which the man is emerging is a dummy one in the training tank. The water has been lowered to enable the photograph to be taken.

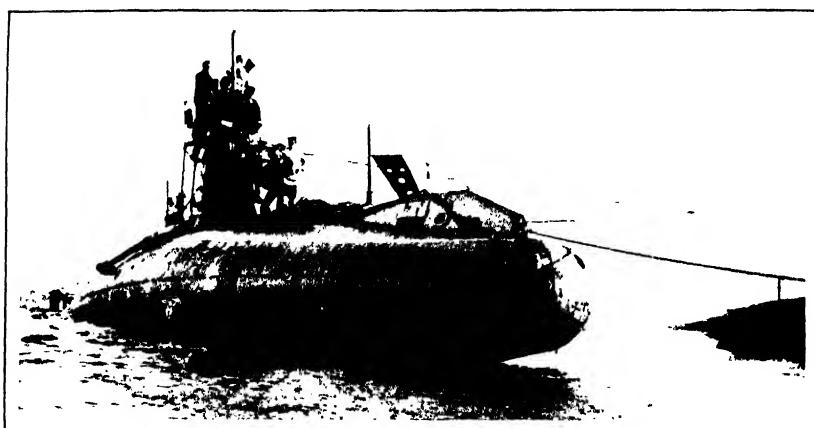
We understand that this invention has been adopted by the British Admiralty, and that men are being rapidly trained in its use. Certainly the idea seems to lack all complications. One of the terrors of a submarine disaster is the deadly gases that are given off by the electric batteries when sea-water comes in contact with them. To combat this, there is a simple arrangement whereby the emergency dresses and the air lock itself can be filled with fresh air from the air cylinder of the submarine. Directly the escaping man reaches the surface, he opens the window of his helmet and breathes the air of Heaven until he is picked up.

Such, briefly and generally, is the submarine—or, more properly, the modern "submersile"—boat and its armament, considered by many the most formidable engine of defence, and in

many ways the most remarkable invention of this very remarkable age.



The number staffs at the sterns of some of our submarines.



An early type of British submarine stranded near the entrance to Portsmouth Harbour.



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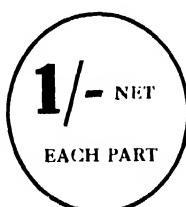
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